



SEQUENCE LISTING

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<120> BIOLOGICAL CONTROL OF NEMATODES

<130> 13384-002001

<140> 09/889,874

<141> 2001-07-23

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<151> 2000-01-24

<150> GB 9901499.5

<151> 1999-01-22

<160> 52

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 662

<212> PRT

<213> Xenorhabdus bovienii

<400> 1

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Glu Glu Phe Trp His Gly Asp Lys Gln Ala Phe Pro Pro Phe Thr Cys
20 25 30
Arg Phe Thr His Phe Asp Pro Asp Lys Glu Gln Asp Val Thr Leu Val
35 40 45
Pro Ser Thr Glu Glu Ala Tyr Trp Leu His Arg Ala Leu Gln Gly Gln
50 55 60
Pro Leu His Ser Glu Val Tyr Gly Asp Asp Gly Thr Ala Gln Ala Gly
65 70 75 80
Ile Pro Tyr Thr Val Met Asp Ser Arg Pro Gln Val Arg Leu Leu Thr
85 90 95
Gly Leu Pro Gly Asn Ser Pro Thr Val Trp Pro Ser Val Ile Glu Gln
100 105 110
Arg Thr Trp Gln Tyr Glu Arg Ile Ala Asp Asp Pro Gln Cys His Gln
115 120 125
Gln Val Val Leu Asn Ser Asp Arg Tyr Gly Phe Pro Arg Glu Thr Val
130 135 140
Asp Ile Ala Tyr Pro Arg Arg Pro Lys Pro Ala Val Ser Pro Tyr Pro
145 150 155 160
Asp Thr Leu Pro Ala Thr Leu Phe Asp Ser Ser Tyr Asp Glu Gln Gln
165 170 175
Gln Gln Leu Arg Leu Thr Arg Gln Arg Gln His Tyr His His Leu Thr
180 185 190
Asp Thr Glu His Gln Val Leu Gly Leu Pro Asp Val Met Arg Ser Asp

| | | |
|---|-----|-----|
| 195 | 200 | 205 |
| Ala Trp Gly Tyr Pro Ala Ala Arg Val Pro Arg Glu Gly Phe Thr Leu | | |
| 210 | 215 | 220 |
| Glu Asp Leu Leu Ala Glu Asn Ser Leu Ile Ala Pro Gly Thr Pro Leu | | |
| 225 | 230 | 235 |
| Thr Tyr Leu Gly His Gln Arg Val Ala Tyr Thr Gly Thr Thr Gly Thr | | |
| 245 | 250 | 255 |
| Glu Glu Lys Pro Thr Arg Gln Ala Leu Val Ala Tyr Thr Glu Thr Ala | | |
| 260 | 265 | 270 |
| Val Phe Asp Glu Leu Ala Leu Gln Ala Phe Asn Gly Thr Leu Ser Pro | | |
| 275 | 280 | 285 |
| Glu Ala Leu Glu Lys Lys Leu Ile Glu Ser Gly Tyr Leu Ser Val Pro | | |
| 290 | 295 | 300 |
| Arg Pro Phe Asn Thr Gly Ala Glu Ser Ala Val Trp Val Ala Arg Gln | | |
| 305 | 310 | 315 |
| Gly Tyr Thr Asp Tyr Gly Gly Ser Glu Ala Phe Tyr Arg Pro Leu Ala | | |
| 325 | 330 | 335 |
| Gln Arg Thr Thr Val Gln Ile Gly Lys Asn Thr Leu His Trp Asp Thr | | |
| 340 | 345 | 350 |
| His Tyr Cys Ala Val Val Arg Met Gln Asp Ala Ala Gly Leu Tyr Thr | | |
| 355 | 360 | 365 |
| Asp Ala Ala Tyr Asp Tyr Arg Phe Leu Thr Pro Val Gln Ile Thr Asp | | |
| 370 | 375 | 380 |
| Ala Asn Asp Asn Gln Gln His Ile Thr Leu Thr Ala Leu Gly Gln Val | | |
| 385 | 390 | 395 |
| Ser Ser Gly Arg Phe Trp Gly Thr Glu Glu Gly Thr Pro Gln Gly Tyr | | |
| 405 | 410 | 415 |
| Thr Pro Pro Glu Asp Arg Pro Phe Thr Pro Pro Ser Ser Val Ala Glu | | |
| 420 | 425 | 430 |
| Ala Leu Asp Leu Lys Pro Asp Leu Pro Val Ala Asn Cys Met Val Tyr | | |
| 435 | 440 | 445 |
| Ala Pro Leu Ser Trp Met Pro Leu Ala His Thr Tyr Gln Glu Tyr Ile | | |
| 450 | 455 | 460 |
| Ala Gly Phe Thr Trp Gln Ala Leu Leu Asp Ala Gly Val Val Thr Glu | | |
| 465 | 470 | 475 |
| Asp Lys Arg Val Cys Ala Leu Gly Phe Arg Arg Trp Val Gln Arg Gln | | |
| 485 | 490 | 495 |
| Gly Ile Val Leu Asn Gly Gln Ala Leu Ala Asp Ser Arg Glu Pro Val | | |
| 500 | 505 | 510 |
| His Val Leu Thr Leu Ala Thr Asp Arg Tyr Asp Thr Asp Pro Asp Gln | | |
| 515 | 520 | 525 |
| Gln Leu Arg Lys Ser Val Thr Tyr Ser Asp Gly Phe Gly Arg Leu Leu | | |
| 530 | 535 | 540 |
| Gln Ser Ala Val Tyr His Ala Pro Gly Glu Ala Trp Gln Arg Ala Ala | | |
| 545 | 550 | 555 |
| Asp Gly Ser Leu Ile Thr Asp Ala Lys Gly Ala Pro Leu Val Ala His | | |
| 565 | 570 | 575 |
| Thr Ala Thr Arg Trp Ala Val Ser Gly Arg Thr Glu Tyr Asp Gly Lys | | |
| 580 | 585 | 590 |
| Gly Gln Pro Val Arg Thr Tyr Pro Pro Phe Phe Leu Asn Ala Trp Gln | | |
| 595 | 600 | 605 |
| Tyr Leu Ser Asp Asp Ser Ala Arg Gln Asp Leu Asn Ala Asp Thr His | | |
| 610 | 615 | 620 |
| Arg Tyr Asp Pro Leu Gly Arg Glu Tyr Gln Val Arg Thr Ala Lys Gly | | |
| 625 | 630 | 635 |
| Tyr Leu Arg Gln Asn Arg Leu Thr Pro Trp Phe Val Val Asn Glu Asp | | |
| 645 | 650 | 655 |

Glu Asn Asp Thr Leu Ser
660

<210> 2
<211> 105
<212> PRT
<213> Xenorhabdus bovienii

<400> 2
Tyr Leu Pro Gln Arg Gly Gln Cys Asp Met Leu Leu Val Val Ile Gly
1 5 10 15
Ile Gly Tyr Leu Asn Gly Gly Gln Glu Ala Val Ile Ile Gly Gly Ile
20 25 30
Arg Val Gln Thr Arg Arg Ile Leu His Thr Asp Asp Arg Thr Val Met
35 40 45
Gly Ile Pro Met Glu Gly Val Phe Ala Asn Leu His Arg Arg Pro Leu
50 55 60
Ser Gln Arg Thr Val Lys Arg Leu Arg Pro Ala Val Ile Gly Ile Ser
65 70 75 80
Leu Thr Gly Asp Pro Asp Arg Arg Phe Arg Thr Gly Ile Glu Trp Ala
85 90 95
Trp Asn Arg Gln Ile Thr Arg Leu Asp
100 105

<210> 3
<211> 971
<212> PRT
<213> Xenorhabdus bovienii

<400> 3
Ser His Leu Pro Ala Arg Tyr Gly Gly Arg Leu Thr Thr Leu Ser Arg
1 5 10 15
Lys Gly Phe Met Thr Val Asn Arg Gly Asp Asn Leu His Gln Lys Thr
20 25 30
Pro Glu Val Thr Val Leu Asp Asn Arg Gly Leu Thr Val Arg Glu Leu
35 40 45
Arg Tyr His Arg His Pro Asn Thr Pro Thr Thr Asp Glu Arg Ile
50 55 60
Thr Arg His Arg Phe Thr Leu Ser Gly Gln Leu Ala His Ser Ile Asp
65 70 75 80
Pro Arg Leu Phe Asp Leu Gln Gln Thr Asp Asn Thr Val Asn Pro Asn
85 90 95
Met Ile Tyr Asp Thr Ala Leu Thr Gly Glu Val Val Arg Thr Arg Ser
100 105 110
Val Asp Ala Gly Asn Asp Leu Ile Leu Asn Asp Ile Thr Gly Arg Pro
115 120 125
Val Leu Ala Ile Asn Ala Thr Glu Val Thr Arg Thr Trp Gln Tyr Glu
130 135 140
Asn Asp Thr Leu Pro Gly Arg Pro Leu Ser Ile Thr Glu Gln Pro Ala
145 150 155 160
Gly Glu Ala Gly Arg Ile Thr Glu Arg Phe Val Trp Ala Gly Asn Ser
165 170 175
Gln Ala Glu Lys Asn Ser Asn Leu Ala Gly Gln Cys Val Arg His Tyr
180 185 190
Asp Thr Ala Gly Leu Asn Gln Thr Asp Ser Ile Ala Leu Asn Gly Ile
195 200 205
Pro Leu Ser Val Thr Arg Gln Leu Leu Pro Asp Gly Thr Asp Ala Asp

| | | |
|---|---------------------|-----|
| 210 | 215 | 220 |
| Trp Gln Gly Asn Asn Glu Pro Ala Trp Asn Asp Arg | Leu Ala Pro Glu | |
| 225 | 230 | 235 |
| Asn Phe Thr Thr Leu Ser Thr Ala Asp Ala Thr Gly | Ala Val Leu Thr | 240 |
| 245 | 250 | 255 |
| Thr Thr Asp Ala Ala Gly Asn Leu Gln Arg Val Ala | Tyr Asp Val Ala | |
| 260 | 265 | 270 |
| Gly Leu Leu Thr Gly Ser Trp Leu Arg Leu Ala Gly | Gly Thr Glu Gln | |
| 275 | 280 | 285 |
| Val Ile Val Lys Ser Leu Thr Tyr Ser Ala Ala Gly | Gln Lys Leu Arg | |
| 290 | 295 | 300 |
| Glu Glu His Gly Asn Gly Val Val Thr Thr Tyr Thr | Tyr Glu Pro Glu | |
| 305 | 310 | 315 |
| Thr Gln Arg Leu Val Gly Ile Lys Thr Lys Arg Pro | Gln Gly His Ala | 320 |
| 325 | 330 | 335 |
| Gln Gly Thr Lys Val Leu Gln Asp Leu Arg Tyr Glu | Tyr Asp Pro Val | |
| 340 | 345 | 350 |
| Gly Asn Val Val Lys Val Thr Asn Asp Ala Glu Val | Thr Arg Phe Trp | |
| 355 | 360 | 365 |
| Arg Asn Gln Lys Val Val Pro Glu Asn Thr Tyr Val | Tyr Asp Ser Leu | |
| 370 | 375 | 380 |
| Tyr Gln Leu Val Ser Ala Thr Gly Arg Glu Met Ala | Asn Ile Val Gln | |
| 385 | 390 | 395 |
| Gln Ser Thr Leu Leu Pro Thr Pro Ser Leu Ile Asp | Ser Ser Thr Tyr | 400 |
| 405 | 410 | 415 |
| Ser Asn Tyr Ser Arg Thr Tyr Asn Tyr Asp Arg Gly | Asp Asn Leu Thr | |
| 420 | 425 | 430 |
| Gln Ile Arg His Ser Ala Pro Ala Thr Gly Asn Ser | Tyr Thr Thr Asp | |
| 435 | 440 | 445 |
| Ile Thr Val Ser Asp His Ser Asn Arg Ala Val Leu | Asp Thr Leu Thr | |
| 450 | 455 | 460 |
| Asp Asp Pro Ala Lys Val Asp Ala Leu Phe Thr Ala | Gly Gly His Gln | |
| 465 | 470 | 475 |
| Ile Pro Leu Gln Pro Gly Gln Asn Leu Val Trp | Thr Pro Arg Gly Glu | |
| 485 | 490 | 495 |
| Leu Leu Lys Val Ala Pro Val Val Arg Asp Gly Gln | Ile Ser Asp Gln | |
| 500 | 505 | 510 |
| Glu Ser Tyr Arg Tyr Asp Ala Ala Ser Gln Arg Ile | Ile Lys Thr His | |
| 515 | 520 | 525 |
| Val Gln Gln Thr Ala Asn Ser Ser Gln Ala Gln | Ser Thr Leu Tyr Leu | |
| 530 | 535 | 540 |
| Pro Gly Leu Glu Arg His Thr Thr Ile Asn Gly Thr | Thr Val Lys Glu | |
| 545 | 550 | 555 |
| Val Leu His Val Ile Thr Ile Gly Glu Ala Gly Arg | Ala Gln Val Arg | 560 |
| 565 | 570 | 575 |
| Val Leu His Trp Glu Asn Gly Lys Pro Gly Ala Ile | Ser Asn Asn Gln | |
| 580 | 585 | 590 |
| Met Arg Tyr Ser Tyr Asp Asn Leu Ile Gly Ser Ser | Gly Leu Glu Val | |
| 595 | 600 | 605 |
| Asp Gly Asp Gly Gln Ile Ile Ser Met Glu Glu Tyr | Tyr Pro Tyr Gly | |
| 610 | 615 | 620 |
| Gly Thr Ala Val Trp Thr Ala Arg Ser Gln Thr Glu | Ala Asp Tyr Lys | |
| 625 | 630 | 635 |
| Thr Val Arg Tyr Ser Gly Lys Glu Arg Asp Ala Thr | Gly Leu Tyr Tyr | 640 |
| 645 | 650 | 655 |
| Tyr Gly Tyr Arg Tyr Tyr Gln Pro Trp Ala Gly Ser | Trp Leu Ser Ala | |
| 660 | 665 | 670 |

Asp Pro Ala Gly Thr Ile Asp Gly Leu Asn Leu Tyr Arg Met Val Arg
 675 680 685
 Asn Asn Pro Ala Thr Leu Asp Asp Lys Asn Gly Leu Ala Pro Gly Asn
 690 695 700
 Arg Tyr Val Phe Phe Pro Phe Ile His Glu Asp Arg Ile Phe Arg Leu
 705 710 715 720
 Ala Ser Ala Asn Val Tyr Arg Thr Glu His Asn Lys Ser Asp Ile Ile
 725 730 735
 Ala Val Val Glu Asp Lys Ala Leu Asp Ser Lys Leu Phe Thr Asn Ser
 740 745 750
 Ile Glu Gln Phe Phe Lys Lys Pro Lys Gly Lys Ala Ile Leu Lys Gly
 755 760 765
 Ser Pro Asp Ile Lys Glu Arg Leu Leu Asn Asn Ile Val His Asp Leu
 770 775 780
 Ser Asn Met Gln Val Gly Asp Gln Leu Tyr Val Asn Ala His Gly His
 785 790 795 800
 Ser Ala Lys Pro Phe Phe Tyr Ser Asp Ser Gly Tyr Ser Lys Ile Ile
 805 810 815
 Met Glu Gln Leu Gln Arg Gly Ala Asn Tyr Val Ala Lys Asp Leu Val
 820 825 830
 Asn Lys Phe Lys Leu Pro Glu Asn Ala Thr Ile Lys Ile Ser Thr Cys
 835 840 845
 His Ser Ala Glu Gly Lys Gly Ala His Ile Thr Val Thr Ser Thr Gly
 850 855 860
 Thr Asn Glu Lys Met Arg Tyr Ser Ser Ile Ile Glu Asn Lys Gly Glu
 865 870 875 880
 Phe Ser Arg Ser Leu Ala Gly Thr Met Glu Asn Glu Leu Ile Lys Leu
 885 890 895
 Gln Pro Gly Arg Val Arg Gly Asn Val Tyr Gly Tyr Leu Gly Ala Thr
 900 905 910
 Thr Phe Tyr Gly Ala Lys Asn Glu Lys Val Ile His Leu Lys Asp Gly
 915 920 925
 Asn Leu Thr Thr Gly Val His Glu Gly Lys Leu Ser Met Phe Thr Lys
 930 935 940
 Lys Asn Arg Phe Ser Glu Asn Ile Phe Gly Leu Lys Val Lys Arg Ser
 945 950 955 960
 Leu Thr Arg Thr Asn Phe Thr Gly Ser Gly Val
 965 970

<210> 4
 <211> 108
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 4

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pro | Ala | Ala | Glu | Tyr | Val | Arg | Asp | Phe | Thr | Ile | Thr | Cys | Ser | Val | Pro |
| 1 | | | 5 | | | 10 | | | | | | 15 | | | |
| Pro | Ala | Ser | Arg | Ser | Gln | Leu | Pro | Val | Ser | Arg | Pro | Ala | Thr | Ser | Tyr |
| | | 20 | | | | 25 | | | | | | 30 | | | |
| Ala | Thr | Arg | Cys | Arg | Leu | Pro | Ala | Ala | Ser | Val | Val | Val | Ser | Thr | Ala |
| | 35 | | | | 40 | | | | | | 45 | | | | |
| Pro | Val | Ala | Ser | Ala | Val | Leu | Arg | Val | Val | Lys | Phe | Ser | Gly | Ala | Ser |
| | 50 | | | | 55 | | | | | 60 | | | | | |
| Arg | Ser | Phe | Gln | Ala | Gly | Ser | Leu | Phe | Pro | Cys | Gln | Ser | Ala | Ser | Val |
| | 65 | | | | 70 | | | | | 75 | | | | 80 | |
| Pro | Ser | Gly | Ser | Ser | Trp | Arg | Val | Thr | Asp | Ser | Gly | Met | Pro | Leu | Ser |
| | | 85 | | | | 90 | | | | | 95 | | | | |

Ala Ile Leu Ser Val Trp Phe Ser Pro Ala Val Ser
 100 105

<210> 5
 <211> 256
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 5
 Gln Arg Ala Leu Leu Asn Asp Ile Gly His Phe Ala Pro Gly Gly Thr
 1 5 10 15
 Asp Gln Leu Ile Gln Ala Val Ile Asp Ile Gly Val Leu Arg His His
 20 25 30
 Phe Leu Val Ala Pro Glu Ala Gly Asn Leu Arg Ile Val Arg His Phe
 35 40 45
 His His Val Pro His Arg Val Val Leu Ile Ala Gln Val Leu Gln His
 50 55 60
 Leu Arg Pro Leu Cys Met Ser Leu Trp Ala Phe Gly Phe Tyr Ala Asn
 65 70 75 80
 Lys Ala Leu Gly Leu Arg Leu Val Gly Val Gly Gly His His Ala Val
 85 90 95
 Ala Val Leu Phe Ala Gln Phe Leu Thr Arg Gly Gly Ile Arg Gln Gly
 100 105 110
 Phe His Asp Asn Leu Leu Cys Pro Ala Arg Lys Pro Gln Pro Thr Ala
 115 120 125
 Ser Gln Gln Ala Cys Tyr Val Ile Arg His Thr Leu Gln Val Thr Gly
 130 135 140
 Arg Ile Gly Gly Gln Tyr Arg Ala Gly Gly Ile Arg Arg Ala Gln
 145 150 155 160
 Gly Gly Glu Val Phe Arg Cys Gln Pro Val Val Pro Gly Gly Phe Ile
 165 170 175
 Val Ser Leu Pro Val Cys Val Arg Thr Ile Arg Gln Gln Leu Ala Arg
 180 185 190
 Asp Gly Gln Arg Tyr Ala Val Lys Arg Asn Thr Val Arg Leu Val Gln
 195 200 205
 Ser Gly Gly Val Ile Val Thr His Ala Leu Ser Gly Gln Val Ala Val
 210 215 220
 Leu Leu Arg Leu Thr Val Pro Cys Pro Asp Lys Thr Leu Cys Asp Thr
 225 230 235 240
 Ala Cys Phe Ala Ser Arg Leu Phe Cys Asp Thr Glu Arg Ala Ser Gly
 245 250 255

<210> 6
 <211> 316
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 6
 Ser Asp Arg Arg Gln Thr Gly Tyr Ala Tyr Ser Ala Asp His Tyr Arg
 1 5 10 15
 Ile Ser Gly Arg Ser Thr Val Cys Thr Val Arg Ala Gly Leu Met Asn
 20 25 30
 Tyr Gln Cys Trp Leu Gln His Ala Ala Thr Gln Leu Ser Glu Ser Asp
 35 40 45
 Ser Pro Lys Arg Asp Ala Glu Ile Leu Leu Gly Tyr Val Thr Gly Arg
 50 55 60
 Ser Arg Thr Tyr Leu Ile Ala Phe Asp Glu Thr Leu Ile Ser Ser Glu

| | | | |
|-----|-----|-----|-----|
| 65 | 70 | 75 | 80 |
| Glu | Leu | His | Gln |
| Leu | Asp | Ser | Leu |
| Leu | Arg | Arg | Ile |
| Val | Gly | Glu | Glu |
| 85 | 90 | 95 | |
| Pro | Val | Ala | Tyr |
| Ile | Ile | Gly | Glu |
| Arg | Glu | Phe | Trp |
| Gly | Arg | Trp | Ser |
| 100 | 105 | 110 | |
| Ala | Val | Ser | Pro |
| Ala | Thr | Leu | Ile |
| Thr | Pro | Arg | Pro |
| Leu | Ile | Asp | Asp |
| Ile | Pro | Glu | Cys |
| 115 | 120 | 125 | |
| Val | Glu | Lys | Ala |
| Leu | Glu | Leu | Leu |
| Leu | Pro | Asp | Ser |
| 130 | 135 | 140 | |
| Asp | Leu | Gly | Thr |
| Gly | Thr | Gly | Ala |
| Ala | Ile | Ala | Leu |
| Ile | Leu | Ala | Ser |
| 145 | 150 | 155 | 160 |
| Arg | Asn | Asp | Cys |
| Tyr | Val | Thr | Gly |
| Val | Asp | Ile | Asn |
| Asp | Ile | Asn | Ser |
| Ala | Val | Asp | Ala |
| 165 | 170 | 175 | |
| Met | Leu | Ala | Gln |
| His | Asn | Ala | Glu |
| Glu | Asn | Ala | Gly |
| 180 | 185 | 190 | |
| His | Asn | Val | Phe |
| Phe | Leu | Gln | Ser |
| Glu | Trp | Phe | Ala |
| 195 | 200 | 205 | |
| Gln | Gln | Phe | Asp |
| Met | Ile | Val | Ser |
| Asn | Pro | Pro | Tyr |
| Pro | Ile | Asp | Glu |
| 210 | 215 | 220 | |
| Asp | Pro | His | Leu |
| Gln | Glu | Gly | Asp |
| Ile | Arg | Phe | Ile |
| 225 | 230 | 235 | 240 |
| Leu | Ile | Ala | Ala |
| Gln | Asn | Gly | Met |
| Ala | Asp | Leu | Gln |
| Ile | Ile | Ala | Ile |
| Val | Gly | Val | Gly |
| 245 | 250 | 255 | |
| Gln | Ala | Arg | His |
| Phe | Leu | Ser | Pro |
| Gly | Trp | Asn | Gly |
| 260 | 265 | 270 | |
| Gly | Trp | Lys | Gln |
| Gly | Thr | Val | Val |
| 275 | 280 | 285 | |
| Tyr | Gln | Ile | Ala |
| Gln | Ile | Thr | Phe |
| 290 | 295 | 300 | |
| Thr | Ile | Gly | Arg |
| Gly | Trp | Asn | Lys |
| Arg | Asn | Glu | Thr |
| 305 | 310 | 315 | |

<210> 7
<211> 102
<212> PRT
<213> Xenorhabdus bovienii

| | | | | | | | | | | | | | | | |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <400> 7 | | | | | | | | | | | | | | | |
| Ala | Arg | Arg | Ala | Val | Arg | Arg | Cys | Gly | Tyr | Cys | Thr | Gly | Arg | Thr | Glu |
| 1 | 5 | 10 | 15 | | | | | | | | | | | | |
| Ser | Arg | Val | Pro | Ser | Val | Thr | Thr | Arg | Cys | Ala | Thr | Ala | Met | Ile | Thr |
| 20 | 25 | 30 | | | | | | | | | | | | | |
| Leu | Ser | Ala | Ala | Ala | Val | Trp | Arg | Trp | Thr | Val | Thr | Asp | Lys | Leu | Ser |
| 35 | 40 | 45 | | | | | | | | | | | | | |
| Val | Trp | Lys | Asn | Thr | Thr | Arg | Thr | Gly | Ala | Leu | Arg | Cys | Gly | Arg | Arg |
| 50 | 55 | 60 | | | | | | | | | | | | | |
| Gly | Val | Arg | Gln | Arg | Leu | Ile | Thr | Arg | Leu | Cys | Val | Thr | Gln | Ala | Arg |
| 65 | 70 | 75 | 80 | | | | | | | | | | | | |
| Ser | Gly | Met | Gln | Arg | Gly | Cys | Ile | Ile | Thr | Ala | Thr | Gly | Ile | Thr | Ser |
| 85 | 90 | 95 | | | | | | | | | | | | | |
| Arg | Gly | Arg | Gly | Ala | Gly | | | | | | | | | | |
| 100 | | | | | | | | | | | | | | | |

<210> 8
<211> 130
<212> PRT
<213> Xenorhabdus bovienii

<400> 8

Trp Gln Asn Gly Gly Ser Ser Ser Thr Thr Pro Arg Tyr Leu Ala Gly
 1 5 10 15
 Cys Tyr Val Trp Tyr Pro Cys Ser Ala Arg Leu Ser Gly Asn Ala Lys
 20 25 30
 Ser Leu Leu Ala Pro Asp Gly Glu Trp Met Lys His Thr Leu Lys Ser
 35 40 45
 Lys Ala Ser Gly Asn Thr Phe Thr Gly Arg Leu Ile Pro Thr Gly Arg
 50 55 60
 Pro Thr Val Val Thr Ile Asp Lys Ser Gly Ala Asn Thr Ala Ala Leu
 65 70 75 80
 Thr Leu Leu Asn Ala Glu Gly Glu Pro Gln Gln Gly Ile Glu Ile Arg
 85 90 95
 Gln Asn Lys Tyr Leu Asn Asn Arg Ile Glu Gln Asp His Arg His Val
 100 105 110
 Lys Arg Arg Ile Arg Pro Met Leu Gly Phe Lys Ser Phe Arg Arg Ala
 115 120 125
 Gln Thr
 130

<210> 9

<211> 119

<212> PRT

<213> Xenorhabdus bovienii

<400> 9

Ala Leu Leu Phe Leu Ser Glu Ser Arg Val Met Ser Leu Ile Arg Asn
 1 5 10 15
 Ala Phe Lys Leu Leu His Tyr Pro Val Asp Ile Met Ala Gln Cys Val
 20 25 30
 Arg Trp Ser Leu Thr Tyr Ala Leu Ser Leu Arg Asn Leu Glu Glu Met
 35 40 45
 Met Ala Lys Arg Gly Ile Phe Val Asp His Ala Thr Ile Pro Arg Trp
 50 55 60
 Val Leu Arg Leu Val Pro Leu Leu Ser Lys Ala Phe Arg Lys Arg Lys
 65 70 75 80
 Lys Pro Val Gly Ser Arg Trp Arg Met Asp Glu Thr Tyr Ile Lys Val
 85 90 95
 Lys Gly Gln Trp Lys Tyr Leu Tyr Arg Ser Val Asp Thr Asp Gly Gln
 100 105 110
 Thr Asp Cys Gly Asp Tyr Arg
 115

<210> 10

<211> 138

<212> PRT

<213> Xenorhabdus bovienii

<400> 10

Val His Ser Pro Ser Gly Ala Val Ala Pro Gly Lys Phe Phe Ile Glu
 1 5 10 15
 Asn Phe Ala Asp Thr Phe Pro Ala Pro Leu Pro Leu His Pro Phe Ile
 20 25 30
 Asp Ala Cys Ile Gln Gln Gly Phe Gln Leu Leu Pro Cys Leu Ile Ala
 35 40 45
 Ile Ala His Ser Gly Lys Gln Ala Phe Glu Cys Val Leu Leu Asp Arg

| | | |
|---|-----|-----|
| 50 | 55 | 60 |
| Leu Ala Leu Gln Gly Ser Gln Cys Leu Gln Ala Leu Val Leu Pro Val | | |
| 65 | 70 | 75 |
| Gly Asp Val Asn Gly Gln Thr Ala His Gly Phe Leu Leu Ile Gly Tyr | | 80 |
| 85 | 90 | 95 |
| Thr Gln Thr His Ile Ser Thr Tyr Asn Gly Leu Trp Leu Phe Ile Thr | | |
| 100 | 105 | 110 |
| Gln Gly Val Arg Tyr Arg Phe Val Arg Gln Thr Phe Val Cys Arg Ser | | |
| 115 | 120 | 125 |
| Leu Ser Phe Ser Glu Asp Asp Cys Thr Asn | | |
| 130 | 135 | |

<210> 11

<211> 110

<212> PRT

<213> Xenorhabdus bovienii

<400> 11

| | | |
|---|-----|-----|
| Arg Thr Cys Arg Glu Arg Pro Arg Leu Met Asp Tyr Val Leu Thr Lys | | |
| 1 | 5 | 10 |
| Ala Ala Glu Ala Asp Leu Arg Ala Ile Ile Arg His Thr Arg Lys Gln | | 15 |
| 20 | 25 | 30 |
| Trp Gly Asp Ala Gln Val Arg Arg Tyr Ile Thr Ala Leu Glu Gln Gly | | |
| 35 | 40 | 45 |
| Ile Ala Arg Leu Ala Val Gly Gln Gly Ser Phe Lys Asp Met Ser Ala | | |
| 50 | 55 | 60 |
| Leu Phe Pro Ala Leu Arg Met Ala His Cys Glu Arg His Tyr Val Phe | | |
| 65 | 70 | 75 |
| Cys Leu Pro Arg Glu Asn Ala Pro Ala Leu Ile Val Ala Ile Phe His | | 80 |
| 85 | 90 | 95 |
| Glu Arg Met Asp Leu Leu Thr Arg Leu Ala Asp Arg Leu Lys | | |
| 100 | 105 | 110 |

<210> 12

<211> 103

<212> PRT

<213> Xenorhabdus bovienii

<400> 12

| | | |
|---|----|----|
| Pro Gln Thr Ile Ile Cys Ala Asn Val Gly Leu Cys Ile Thr Asp Lys | | |
| 1 | 5 | 10 |
| Glu Lys Thr Met Ser Arg Leu Thr Ile Asp Ile Thr Asp Arg Gln His | | 15 |
| 20 | 25 | 30 |
| Gln Ser Leu Lys Ala Leu Ala Ala Leu Gln Gly Lys Thr Ile Lys Gln | | |
| 35 | 40 | 45 |
| Tyr Ala Leu Glu Arg Leu Phe Pro Gly Met Ser Asp Ser Asp Gln Ala | | |
| 50 | 55 | 60 |
| Trp Gln Glu Leu Lys Ala Leu Leu Asp Thr Arg Ile Asn Glu Gly Met | | |
| 65 | 70 | 75 |
| Glu Gly Lys Gly Cys Gly Lys Ser Ile Gly Glu Ile Leu Asp Glu Glu | | 80 |
| 85 | 90 | 95 |
| Leu Ala Gly Ser Asp Arg Ala | | |
| 100 | | |

<210> 13

<211> 265

<212> PRT

<213> Xenorhabdus bovienii

<400> 13

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Ala | His | Phe | Leu | Ile | Val | Ser | Lys | Thr | Asn | Val | Val | Met | Ser | Asn |
| 1 | | | 5 | | | | | 10 | | | | | | 15 | |
| Gln | Asp | Pro | His | Asn | Lys | Arg | Asp | Ser | Leu | Phe | Ser | Ala | Pro | Ile | Ala |
| | | | 20 | | | | | 25 | | | | | | 30 | |
| Asn | Leu | Gly | Asp | Trp | Ser | Phe | Asp | Glu | Arg | Val | Ala | Glu | Val | Phe | Pro |
| | 35 | | | | | 40 | | | | | | 45 | | | |
| Asp | Met | Val | Lys | Arg | Ser | Ile | Pro | Gly | Tyr | Ser | Asn | Ile | Ile | Ser | Met |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Ile | Gly | Met | Leu | Ala | Ser | Arg | Phe | Val | Thr | Pro | Gly | Ser | Gln | Ile | Tyr |
| 65 | | | | | 70 | | | | 75 | | | | 80 | | |
| Asp | Leu | Gly | Cys | Ser | Leu | Gly | Ala | Ala | Thr | Leu | Ser | Ile | Arg | Arg | Ser |
| | | 85 | | | | | | 90 | | | | | 95 | | |
| Ile | Asn | Ala | Asp | Asn | Cys | Arg | Ile | Ile | Ala | Ile | Asp | Asn | Ser | Pro | Ala |
| | | 100 | | | | | 105 | | | | | 110 | | | |
| Met | Ile | Glu | Arg | Cys | Arg | Arg | His | Ile | Asp | Ser | Phe | Lys | Ala | Ser | Thr |
| | 115 | | | | | 120 | | | | | | 125 | | | |
| Pro | Val | Glu | Val | Ile | Glu | Gln | Asn | Ile | Leu | Asp | Thr | Asp | Ile | Gln | Asn |
| | 130 | | | | 135 | | | | | 140 | | | | | |
| Ala | Ser | Met | Val | Val | Leu | Asn | Phe | Thr | Leu | Gln | Phe | Leu | His | Pro | Asp |
| 145 | | | | | 150 | | | | 155 | | | | 160 | | |
| Asp | Arg | Gln | Lys | Ile | Leu | Lys | Lys | Ile | Tyr | Ala | Gly | Leu | Lys | Pro | Gly |
| | | 165 | | | | | 170 | | | | | 175 | | | |
| Gly | Val | Leu | Val | Leu | Ser | Glu | Lys | Phe | Asn | Phe | Glu | Asp | Gln | Lys | Ile |
| | | 180 | | | | 185 | | | | | 190 | | | | |
| Gly | Glu | Leu | Leu | Phe | Asn | Met | His | His | Asp | Phe | Lys | Arg | Ala | Asn | Gly |
| | 195 | | | | | 200 | | | | | 205 | | | | |
| Tyr | Ser | Glu | Leu | Glu | Val | Ser | Gln | Lys | Arg | Ser | Met | Leu | Glu | Asn | Val |
| | 210 | | | | 215 | | | | | 220 | | | | | |
| Met | Arg | Thr | Asp | Ser | Val | Asp | Thr | His | Lys | Ser | Arg | Leu | Lys | Glu | Val |
| 225 | | | | | 230 | | | | 235 | | | | 240 | | |
| Gly | Phe | Gln | His | Val | Glu | Val | Trp | Phe | Gln | Cys | Phe | Asn | Phe | Gly | Ser |
| | | 245 | | | | 250 | | | | | 255 | | | | |
| Leu | Leu | Ala | Ile | Lys | Gly | Thr | Glu | Gln | | | | | | | |
| | | 260 | | | | 265 | | | | | | | | | |

<210> 14

<211> 324

<212> PRT

<213> Xenorhabdus bovienii

<400> 14

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Met | Ile | Asp | Phe | Gly | Asn | Phe | Tyr | Gln | Leu | Ile | Ala | Lys | His | Pro |
| 1 | | | 5 | | | 10 | | | | | | | 15 | | |
| Leu | Asn | His | Trp | Leu | Asp | Ser | Leu | Pro | Ala | Gln | Leu | Ser | His | Trp | Gln |
| | | | 20 | | | 25 | | | | | | 30 | | | |
| Lys | Thr | Ser | Gln | His | Gly | Gln | Phe | Ser | Ser | Trp | Val | Lys | Ile | Leu | Glu |
| | 35 | | | | 40 | | | | | | 45 | | | | |
| Asn | Leu | Pro | Glu | Ile | Lys | Pro | Ser | His | Leu | Asp | Leu | Lys | Asn | Gly | Val |
| | 50 | | | | 55 | | | | | 60 | | | | | |
| Ile | Ala | Ile | His | Glu | Pro | Asp | Leu | Ser | Lys | Gly | Glu | Lys | Ala | Arg | Leu |
| 65 | | | | 70 | | | | | 75 | | | 80 | | | |
| His | Asn | Ile | Leu | Lys | Ile | Leu | Met | Pro | Trp | Arg | Lys | Gly | Pro | Phe | Ser |
| | | | 85 | | | 90 | | | | | 95 | | | | |
| Leu | Tyr | Asp | Val | Glu | Ile | Asp | Thr | Glu | Trp | Arg | Ser | Asp | Trp | Lys | Trp |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 100 | 105 | 110 | | | | | | | | | | | | |
| Glu | Arg | Val | Leu | Pro | His | Ile | Ser | Pro | Leu | Glu | Gly | Lys | Thr | Val | Leu |
| | | | | | | | | | | | | | | | |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Asp | Val | Gly | Cys | Gly | Ser | Gly | Tyr | His | Met | Trp | Arg | Met | Val | Gly | Glu |
| | | | | | | | | | | | | | | | |
| | | 130 | | | | | 135 | | | | 140 | | | | |
| Gly | Ala | Gln | Leu | Val | Val | Gly | Ile | Asp | Pro | Thr | Gln | Leu | Phe | Leu | Cys |
| | | | | | | | | | | | | | | | |
| | | 145 | | | | | 150 | | | | 155 | | | 160 | |
| Gln | Phe | Glu | Ala | Ile | Arg | Lys | Leu | Leu | Gly | Asn | Asn | Gln | Arg | Ala | His |
| | | | | | | | | | | | | | | | |
| | | 165 | | | | | 170 | | | | | 175 | | | |
| Leu | Leu | Pro | Leu | Gly | Ile | Glu | Gln | Leu | Pro | Glu | Leu | Gln | Ala | Phe | Asp |
| | | | | | | | | | | | | | | | |
| | | 180 | | | | | 185 | | | | | 190 | | | |
| Thr | Val | Phe | Ser | Met | Gly | Val | Leu | Tyr | His | Arg | Arg | Ser | Pro | Leu | Asp |
| | | | | | | | | | | | | | | | |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| His | Leu | Trp | Gln | Leu | Lys | Asn | Gln | Leu | Val | Ser | Asp | Gly | Glu | Leu | Val |
| | | | | | | | | | | | | | | | |
| | | 210 | | | | | 215 | | | | | 220 | | | |
| Leu | Glu | Ser | Leu | Val | Ile | Glu | Gly | Asp | Glu | Asn | Gln | Cys | Leu | Ile | Pro |
| | | | | | | | | | | | | | | | |
| | | 225 | | | | | 230 | | | | | 235 | | | 240 |
| Gly | Glu | Arg | Tyr | Ala | Gln | Met | Arg | Asn | Val | Tyr | Phe | Ile | Pro | Ser | Ala |
| | | | | | | | | | | | | | | | |
| | | 245 | | | | | 250 | | | | | 255 | | | |
| Lys | Met | Leu | Lys | Val | Trp | Leu | Glu | Lys | Cys | Gly | Phe | Val | Asp | Val | Arg |
| | | | | | | | | | | | | | | | |
| | | 260 | | | | | 265 | | | | | 270 | | | |
| Ile | Val | Asp | His | Ala | Ala | Thr | Thr | Pro | Asp | Glu | Gln | Arg | Arg | Thr | Glu |
| | | | | | | | | | | | | | | | |
| | | 275 | | | | | 280 | | | | | 285 | | | |
| Trp | Met | Lys | Thr | Glu | Ser | Leu | Val | Asp | Phe | Leu | Asp | Pro | Ser | Asp | His |
| | | | | | | | | | | | | | | | |
| | | 290 | | | | | 295 | | | | | 300 | | | |
| Ser | Lys | Thr | Ile | Glu | Gly | Tyr | Pro | Ala | Pro | Leu | Arg | Ala | Val | Leu | Ile |
| | | | | | | | | | | | | | | | |
| | | 305 | | | | | 310 | | | | | 315 | | | 320 |
| Ala | Arg | Lys | Pro | | | | | | | | | | | | |

<210> 15
<211> 100
<212> PRT
<213> Xenorhabdus bovienii

| | | | | | | | | | | | | | | | |
|-----|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | <400> 15 | | | | | | | | | | | | | | |
| Ser | Leu | Gln | Ile | Asp | Arg | Glu | Lys | Val | Gly | Leu | Asp | Arg | Tyr | Pro | Gln |
| | | | | 1 | 5 | | | 10 | | | 15 | | | | |
| Pro | Ile | Glu | Arg | Leu | Arg | Gln | Pro | Cys | Ala | Thr | Cys | Asp | Asn | His | Cys |
| | | | | | 20 | | | 25 | | | 30 | | | | |
| His | Ser | Arg | His | Gln | Val | Arg | Phe | Phe | Leu | Leu | Lys | Glu | Lys | Tyr | Gly |
| | | | | | 35 | | 40 | | | 45 | | | | | |
| Ala | Ala | Leu | Ala | Pro | Ile | Ser | Ser | Gln | Ser | Ala | Ile | Arg | Tyr | Gln | Phe |
| | | | | | 50 | | 55 | | | 60 | | | | | |
| Gln | Arg | His | Thr | Met | Lys | Lys | Gly | Leu | Phe | Ala | Met | Ala | Ser | Ile | Phe |
| | | | | | 65 | | 70 | | | 75 | | | 80 | | |
| Ser | Gly | Tyr | Cys | Gly | Gly | Glu | Leu | Phe | His | Leu | Leu | Thr | Asp | Pro | Ala |
| | | | | | 85 | | | 90 | | | | 95 | | | |
| His | Glu | Ser | Gln | | | | | | | | | | | | |
| | | | | 100 | | | | | | | | | | | |

<210> 16
<211> 267
<212> PRT
<213> Xenorhabdus bovienii

<400> 16

Ser Ser Phe Arg Leu Asn Asp Asp Leu Leu Thr Asn Ser Tyr Ser Glu
 1 5 10 15
 Gly Phe Leu Met Ile Lys Leu Glu Ile Cys Cys Tyr Ser Ile Ser Cys
 20 25 30
 Ala Leu Val Ala Gln Asn Ala Gly Ala Asp Arg Ile Glu Leu Ser Ala
 35 40 45
 Ser Pro Leu Glu Gly Gly Leu Thr Pro Ser Phe Gly Ala Leu Gln Gln
 50 55 60
 Ser Leu Gln Arg Leu Ser Ile Pro Val His Pro Ile Val Arg Pro Arg
 65 70 75 80
 Gly Gly Asp Phe Cys Tyr Asn Asn Met Asp Phe Glu Ala Met Lys Asn
 85 90 95
 Asp Val Ala Arg Ile Arg Asp Met Gly Phe Pro Gly Ile Val Phe Gly
 100 105 110
 Ile Leu Ser Glu Asn Gly His Ile Asp Arg Leu Arg Met Arg Gln Leu
 115 120 125
 Met Ser Leu Ser Gly Asn Met Ala Val Thr Phe His Arg Ala Phe Asp
 130 135 140
 Met Cys Phe Asn Pro His Val Ala Leu Glu Gln Leu Thr Glu Leu Gly
 145 150 155 160
 Val Gln Arg Ile Leu Thr Ser Gly Gln Gln Asn Ala Glu Leu Gly
 165 170 175
 Leu Thr Leu Leu Lys Glu Leu Met Gln Ala Ser Arg Gly Pro Ile Ile
 180 185 190
 Met Pro Gly Ala Gly Val Arg Val Ser Asn Ile Ser Lys Phe Leu Glu
 195 200 205
 Ala Gly Met Thr Glu Val His Ser Ser Ala Gly Lys Ile Val Pro Ser
 210 215 220
 Thr Met Lys Tyr Arg Lys Val Gly Val Ala Met Ser Ser Asp Asp Arg
 225 230 235 240
 Asp Val Asp Glu Tyr Ser His Tyr Ser Val Asp Gly Glu Leu Val Glu
 245 250 255
 Ser Met Lys Gly Val Met Ser Leu Ile Lys Arg
 260 265

<210> 17

<211> 189

<212> PRT

<213> Xenorhabdus bovienii

<400> 17

Tyr Phe Gly Lys Asn Arg Arg Phe Val Ile Tyr Val Thr Leu Met Glu
 1 5 10 15
 Arg Asn Phe Tyr Gly Leu Phe Asn Gly Glu Glu Met Ser His Phe Ser
 20 25 30
 Lys Ile Ser Glu Leu Gln Asp Leu Val Ala Asp Leu Ala Gly Phe Glu
 35 40 45
 Gln Lys Leu Lys Gln Phe Glu Gly His Leu Gly Leu His Phe Glu Gln
 50 55 60
 Tyr Ser Ala Asp His Ile Ser Leu Arg Cys Asn Glu Ser Lys Ile Ala
 65 70 75 80
 Asp Arg Trp Arg Lys Gly Phe Leu Gln Cys Gly Gln Leu Ile Ser Glu
 85 90 95
 Ser Ile Ile Asn Gly Arg Pro Ile Cys Leu Phe Asp Leu Asn Gln Pro
 100 105 110
 Ile Val Leu Leu Asp Trp Lys Ile Asp Cys Val Glu Leu Pro Tyr Pro
 115 120 125

Ser Gln Lys His Tyr Val His Gln Gly Trp Glu His Val Glu Leu Val
 130 135 140
 Leu Pro Val Pro Pro Glu Gln Leu Ile Cys Glu Ala Lys Lys Leu Leu
 145 150 155 160
 Pro Gln Pro Leu Pro Asp Asn Phe Arg Met Lys Glu Ser His Pro Lys
 165 170 175
 Gly Lys Asn Glu Arg Leu Pro Asn Pro Ile Leu Ala Val
 180 185

<210> 18

<211> 579

<212> PRT

<213> Xenorhabdus bovienii

<400> 18

Gly Asn Thr Val Asn Ile Gln Val Ile Leu Ser Glu Lys Ile Ser Asn
 1 5 10 15
 Ala Leu Ile Glu Ala Gly Ala Pro Thr Asp Ser Glu Ala His Val Arg
 20 25 30
 Gln Ser Ala Lys Ala Gln Phe Gly Asp Tyr Gln Ala Asn Gly Val Met
 35 40 45
 Ala Ala Ala Lys Lys Val Gly Ile Pro Pro Arg Gln Leu Ala Glu Lys
 50 55 60
 Val Val Ser Gln Leu Asp Leu Gln Gly Ile Ala Ser Lys Val Glu Ile
 65 70 75 80
 Ala Gly Pro Gly Phe Ile Asn Ile Phe Leu Asp Lys Ala Trp Val Ala
 85 90 95
 Ala Asn Ile Glu Thr Thr Leu Lys Asp Glu Lys Leu Gly Ile Thr Pro
 100 105 110
 Val Glu Pro Gln Thr Ile Val Ile Asp Tyr Ser Ala Pro Asn Val Ala
 115 120 125
 Lys Gln Met His Val Gly His Leu Arg Ser Thr Ile Ile Gly Asp Ala
 130 135 140
 Ala Ala Arg Thr Leu Glu Phe Leu Gly His Lys Val Ile Arg Ala Asn
 145 150 155 160
 His Val Gly Asp Trp Gly Thr Gln Phe Gly Met Leu Ile Ala Tyr Leu
 165 170 175
 Glu Lys Ile Gln Asn Glu Asn Ala Asn Asp Met Ala Leu Ala Asp Leu
 180 185 190
 Glu Ala Phe Tyr Arg Glu Ala Lys Lys His Tyr Asp Glu Asp Glu Glu
 195 200 205
 Phe Ala Ile Arg Ala Arg Asn Tyr Val Val Lys Leu Gln Gly Gly Asp
 210 215 220
 Glu Tyr Cys Arg Lys Met Trp Arg Lys Leu Val Asp Ile Thr Met Ser
 225 230 235 240
 Gln Asn Gln Glu Thr Tyr Asn Arg Leu Asn Val Thr Leu Thr Glu Lys
 245 250 255
 Asp Val Met Gly Glu Ser Leu Tyr Asn Asp Met Leu Pro Gly Ile Val
 260 265 270
 Ala Asp Leu Lys Gln Arg Gly Ile Ala Val Lys Ser Asp Gly Ala Thr
 275 280 285
 Val Val Tyr Leu Asp Glu Phe Lys Asn Lys Glu Gly Glu Pro Met Gly
 290 295 300
 Val Ile Ile Gln Lys Lys Asp Gly Gly Tyr Leu Tyr Thr Thr Thr Asp
 305 310 315 320
 Ile Ala Cys Ala Lys Tyr Arg His Glu Thr Leu Asn Ala Ser Arg Val
 325 330 335

Leu Tyr Tyr Ile Asp Ser Arg Gln His Gln His Leu Met Gln Ala Trp
 340 345 350
 Ala Ile Val Arg Lys Thr Gly Tyr Ile Pro Glu Ser Met Ser Leu Glu
 355 360 365
 His His Met Phe Gly Met Met Leu Gly Lys Asp Gly Lys Pro Phe Lys
 370 375 380
 Thr Arg Ala Gly Gly Thr Val Arg Leu Ser Asp Leu Leu Asp Glu Ala
 385 390 395 400
 Ile Glu Arg Ala Asp Thr Leu Ile Arg Glu Lys Asn Pro Asp Met Pro
 405 410 415
 Glu Asp Glu Leu Lys Lys Val Val Glu Ala Val Gly Ile Gly Ala Val
 420 425 430
 Lys Tyr Ala Asp Leu Ser Lys Ser Arg Thr Thr Asp Tyr Val Phe Asp
 435 440 445
 Trp Asp Asn Met Leu Ala Phe Glu Gly Asn Thr Ala Pro Tyr Met Gln
 450 455 460
 Tyr Ala Tyr Thr Arg Val Ser Ser Ile Phe Lys Arg Ala Asp Ile Asp
 465 470 475 480
 Glu Asn Ser Leu Thr Leu Pro Val Met Leu Asn Glu Glu Arg Glu Gln
 485 490 495
 Ala Leu Ala Thr Arg Leu Leu Gln Phe Glu Glu Thr Ile Thr Thr Val
 500 505 510
 Ala Arg Glu Gly Thr Pro His Val Met Cys Ala Tyr Leu Tyr Asp Leu
 515 520 525
 Ala Gly Leu Phe Ser Gly Phe Tyr Glu His Cys Pro Ile Leu Asn Ala
 530 535 540
 Asp Ser Glu Glu Leu Arg Gln Ser Arg Leu Lys Leu Ala Leu Leu Thr
 545 550 555 560
 Ala Lys Thr Leu Lys Gln Gly Leu Asp Thr Leu Gly Ile Gln Thr Val
 565 570 575
 Glu Arg Met

<210> 19
 <211> 126
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 19

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Gln | Val | Ser | Asn | Met | His | Leu | Leu | Gly | Asp | Ile | Arg | Cys | Gly | Ile |
| 1 | | 5 | | | | | 10 | | | | | | 15 | | |
| Ile | Asp | Asn | Asp | Gly | Leu | Arg | Phe | His | Trp | Gly | Asp | Thr | Glu | Leu | Phe |
| | 20 | | | | | | 25 | | | | | | 30 | | |
| Ile | Phe | Gln | Gly | Ser | Phe | Tyr | Ile | Cys | Cys | Asn | Pro | Arg | Phe | Ile | Lys |
| | 35 | | | | | | 40 | | | | | 45 | | | |
| Lys | Asn | Ile | Asp | Lys | Thr | Trp | Ala | Cys | Asn | Phe | Asn | Phe | Ala | Gly | Asn |
| | 50 | | | | | | 55 | | | | | 60 | | | |
| Ser | Leu | Gln | Ile | Gln | Leu | Ala | Asp | Asp | Phe | Phe | Cys | Gln | Leu | Ser | Arg |
| | 65 | | | | | | 70 | | | | 75 | | 80 | | |
| Arg | Tyr | Ser | His | Leu | Phe | Ser | Gly | Ser | His | His | Thr | Ile | Arg | Leu | Ile |
| | | | | | | | 85 | | | | 90 | | 95 | | |
| Val | Thr | Lys | Leu | Cys | Phe | Gly | Arg | Leu | Thr | Asp | Val | Ser | Phe | Thr | Val |
| | | | | | | | 100 | | | 105 | | | 110 | | |
| Gly | Trp | Ser | Ala | Ser | Phe | Asn | Gln | Arg | Ile | Ala | Asp | Phe | Phe | | |
| | | | | | | | 115 | | | 120 | | | 125 | | |

<210> 20

<211> 104
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 20
 His Ala Arg Val Gly Val Leu His Ile Arg Cys Arg Val Ala Phe Lys
 1 5 10 15
 Gly Gln His Ile Ile Pro Val Glu Asn Ile Val Cys Ser Thr Ala Leu
 20 25 30
 Gly Lys Ile Cys Ile Phe His Arg Ala Asn Pro Tyr Arg Phe His Asp
 35 40 45
 Phe Phe Gln Phe Val Phe Trp His Ile Trp Val Phe Leu Thr Asn Glu
 50 55 60
 Gly Ile Arg Thr Leu Asn Arg Phe Ile Gln Gln Ile Gly Gln Ser Tyr
 65 70 75 80
 Cys Ala Ala Gly Thr Gly Phe Glu Trp Phe Thr Ile Phe Ala Gln His
 85 90 95
 His Ala Lys His Val Val Phe Glu
 100

<210> 21
 <211> 120
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 21
 Tyr His Ala Ser Phe Gln Leu Cys Arg Arg Leu Leu His Thr Phe Tyr
 1 5 10 15
 Ser Leu Asn Thr Gln Ser Ile Lys Thr Leu Leu Gln Ser Phe Arg Cys
 20 25 30
 Gln Gln Ser Gln Leu Gln Ala Ala Leu Ala Gln Phe Phe Ala Ile Gly
 35 40 45
 Ile Gln Asp Arg Ala Val Leu Ile Glu Thr Arg Glu Gln Thr Gly Gln
 50 55 60
 Ile Val Gln Val Cys Thr His Asn Met Trp Arg Thr Phe Thr Gly Asp
 65 70 75 80
 Gly Ser Asp Arg Phe Phe Lys Leu Gln Gln Ala Gly Cys Gln Cys Leu
 85 90 95
 Leu Ala Phe Phe Ile Gln His His Arg Gln Cys Gln Ala Val Phe Ile
 100 105 110
 Asp Ile Arg Thr Phe Lys Asp Arg
 115 120

<210> 22
 <211> 334
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 22
 Phe Thr Leu Arg Glu Asp Ser Met Ser Asp Trp Thr Gly Val Ser Thr
 1 5 10 15
 Phe Asn Val Ile Leu Glu Thr Gly Leu Asp Asn Cys Asn Ile Tyr Ala
 20 25 30
 Asn Gly Leu Asn Met Ile Gly Val Ile Ile Asn Ile Thr Pro Thr Asp
 35 40 45
 Asp Glu Gly Asn Phe Val Asp Ile Asp Asp Val Thr Leu Asn Asp Asn
 50 55 60

Ile Lys Ile Val Asp Tyr Ile Asp Gly Ser Asp Ile Asp Gly Ser Asp
 65 70 75 80
 Gly Trp Phe Tyr Thr Gly Asn Pro Asn Glu Tyr Asn Thr Ile Pro Asn
 85 90 95
 Ser Gln Ser Tyr Ser Leu Leu Lys Ser Glu Asn Ser Gln Ile Thr Gln
 100 105 110
 Ile Lys Arg Tyr Val Ser Cys Ser Asn Thr Ser Arg Leu Arg Thr Lys
 115 120 125
 Ser Phe Ser Ala Lys Val Thr Thr Ser Gly Lys Val Ile Ser Ile
 130 135 140
 Thr Gln Asn Ser Ile Asn Ser Ser Arg Val Val Ile Asn Ala Ile Asp
 145 150 155 160
 Ala Thr Asn Phe Thr Asp Asp Glu Leu Arg Thr Thr Lys Glu Thr Arg
 165 170 175
 Phe Glu Asn Gln Ser Tyr Thr Ser His Lys Ser Ser Thr Asn Ser Leu
 180 185 190
 Tyr Val His Thr Trp Thr Ile Pro Arg Ser Leu Lys Leu Gln Asn Trp
 195 200 205
 Arg Trp Glu Asp Tyr Asn Asn Gly Trp Thr Trp Ala Gln Ser Cys Tyr
 210 215 220
 Tyr Lys Thr Gly Ala Asp Gly Gly Ser Glu Ser Thr Arg Trp Leu Ala
 225 230 235 240
 Ala Gly Ser Ile Phe Pro Pro Gly Asn Tyr Asp Gly Leu Trp Leu Asp
 245 250 255
 Asn Asp Ile Ala Leu Ser Gly Met Ala His Lys Ser Tyr Asn Val Asp
 260 265 270
 Thr Gly Ile Asn Gln Leu Ser Phe Thr Arg Ile Ile Gly Lys Gly Phe
 275 280 285
 Ser Trp Val Tyr Asn Ile Ser Gly Leu Asp Arg Gly His Ala Val Ile
 290 295 300
 Ile Ile Asp Gln Tyr Gly Asn Lys Tyr Arg Ile Leu Phe His Ala Gly
 305 310 315 320
 Tyr Glu Asn Ser Asp Pro Tyr Leu Ser Ser Ser Ile Val Tyr
 325 330

<210> 23

<211> 1673

<212> PRT

<213> Xenorhabdus bovienii

<400> 23

Val Tyr Ile Lys Phe Leu Lys Leu Phe Arg Arg Ile Thr Met Ser Asp
 1 5 10 15
 Asn Asn Glu Phe Phe Thr Gln Ala Asn Asn Phe Thr Ser Ala Val Ser
 20 25 30
 Gly Gly Val Asp Pro Arg Thr Gly Leu Tyr Asn Ile Gln Ile Thr Leu
 35 40 45
 Gly His Ile Val Gly Asn Gly Asn Leu Gly Pro Thr Leu Pro Leu Thr
 50 55 60
 Leu Ser Tyr Ser Pro Leu Asn Lys Thr Asp Ile Gly Phe Gly Ile Gly
 65 70 75 80
 Phe Asn Phe Gly Leu Ser Val Tyr Asp Arg Lys Asn Ser Leu Leu Ser
 85 90 95
 Leu Ser Thr Gly Glu Asn Tyr Lys Val Ile Glu Thr Asp Lys Thr Val
 100 105 110
 Lys Leu Gln Gln Lys Lys Leu Asp Asn Leu Arg Phe Glu Lys Asp Leu
 115 120 125

Lys Glu Asn Cys Tyr Arg Ile Ile His Lys Ser Gly Asp Ile Glu Val
 130 135 140
 Leu Thr Gly Phe Asn Asn Ala Phe Asp Leu Lys Val Pro Lys Lys
 145 150 155 160
 Leu Leu Asn Pro Ala Gly His Ala Ile Tyr Ile Asp Trp Asn Phe Glu
 165 170 175
 Ala Thr Gln Pro Arg Leu Asn Arg Ile Tyr Asp Asp Leu Asp Gly His
 180 185 190
 Asp Ile Pro Leu Leu Asn Leu Glu Tyr Gln Gly Leu Ile Lys Thr Ile
 195 200 205
 Leu Thr Leu Phe Pro Gly Gln Lys Glu Gly Tyr Arg Thr Glu Leu Arg
 210 215 220
 Phe Leu Asn Arg Gln Leu Asn Ser Ile His Asn Phe Ser Leu Gly Asn
 225 230 235 240
 Glu Asn Pro Leu Thr Trp Ser Phe Gly Tyr Thr Pro Ile Gly Lys Asn
 245 250 255
 Gly Ile Leu Gly Gln Trp Ile Thr Ser Met Thr Ala Pro Gly Gly Leu
 260 265 270
 Lys Glu Thr Val Asn Tyr Ser Asn Asn Gln Gly His His Phe Pro
 275 280 285
 Gln Ser Ala Asn Leu Pro Val Leu Pro Tyr Val Thr Leu Met Lys Gln
 290 295 300
 Val Pro Gly Ala Gly Gln Pro Ala Ile Gln Ala Glu Tyr Ser Tyr Thr
 305 310 315 320
 Ser His Asn Tyr Val Gly Gly Ser Asn Gly Ile Trp Asn Asn Lys
 325 330 335
 Leu Asp Asn Leu Tyr Gly Leu Met Thr Glu Tyr Asn Tyr Gly Ser Thr
 340 345 350
 Glu Ser Arg Arg Tyr Lys Asp Lys Glu Gly His Asp Gln Ile Val Arg
 355 360 365
 Ile Glu Arg Thr Tyr Asn Asn Tyr His Leu Leu Thr Ser Glu Cys Lys
 370 375 380
 Gln Gln Asn Gly Tyr Ile Gln Thr Thr Glu Thr Ala Tyr Tyr Ala Ile
 385 390 395 400
 Ile Gly His Asn Phe Asp Ser Gln Pro Ser Gln Phe Gln Leu Pro Lys
 405 410 415
 Thr Lys Thr Glu Thr Trp Arg Ser Ala Asp Asn Ser Tyr Arg Ser Glu
 420 425 430
 Ile Thr Glu Thr Thr Phe Asp Glu Ser Gly Asn Pro Leu Thr Lys Val
 435 440 445
 Ile Lys Asp Lys Lys Thr Gln Lys Ile Ile Ser Pro Ser Thr His Trp
 450 455 460
 Glu Tyr Tyr Pro Pro Ala Gly Glu Val Asp Asn Cys Pro Pro Glu Pro
 465 470 475 480
 Tyr Gly Phe Thr Arg Phe Val Lys Lys Ile Ile Gln Thr Pro Tyr Asp
 485 490 495
 Ser Glu Phe Lys Asp Asp Pro Glu Lys Phe Ile Gln Tyr Arg Tyr Ser
 500 505 510
 Leu Ile Gly Ser Gln Ser His Val Thr Leu Lys Ile Glu Glu Arg His
 515 520 525
 Tyr Ser Ala Thr Gln Leu Leu Asn Ser Thr Leu Phe Gln Tyr Asn Thr
 530 535 540
 Asp Lys Ser Glu Leu Gly Arg Leu Leu Lys Gln Thr Glu Cys Thr Lys
 545 550 555 560
 Gly Glu Asn Gly Lys Thr Tyr Ser Val Val His Lys Phe Thr Tyr Thr
 565 570 575
 Lys Gln Asp Asp Thr Leu Gln Gln Ser His Ser Ile Thr Thr His Asp

| 580 | 585 | 590 |
|---|------|------|
| Asn Phe Thr Ile His Arg Ser Gln Val Arg Ser Arg Tyr Thr Gly Arg | | |
| 595 | 600 | 605 |
| Leu Phe Ser Asp Thr Asp Thr Lys Asp Ile Val Thr Gln Met Ser Tyr | | |
| 610 | 615 | 620 |
| Asp Lys Leu Gly Arg Leu Leu Thr Arg Thr Leu Asn Ser Gly Thr Pro | | |
| 625 | 630 | 635 |
| Tyr Ala Asn Thr Leu Thr Tyr Asp Tyr Glu Leu Asn Asn Leu Gln Asp | | |
| 645 | 650 | 655 |
| Asp Asn Arg Pro Pro Phe Val Ile Thr Thr Asp Val Asn Gly Asn | | |
| 660 | 665 | 670 |
| Gln Leu Arg Asn Glu Phe Asp Gly Ala Gly Arg His Val Ser Gln Cys | | |
| 675 | 680 | 685 |
| Leu Lys Asp Ser Asp Gly Asp Gly Lys Phe Tyr Thr Ile His Thr Gln | | |
| 690 | 695 | 700 |
| Gln Tyr Asp Glu Gln Gly Arg His His Thr Ser Thr Tyr Ser Asp Tyr | | |
| 705 | 710 | 715 |
| Leu Thr Asn Gly Arg Gln Gln Thr Asp Pro Asp Lys Val His Leu Ser | | |
| 725 | 730 | 735 |
| Met Ser Lys Ser Tyr Asp Asn Trp Gly Gln Ile Ala Asn Thr His Trp | | |
| 740 | 745 | 750 |
| Ser Tyr Gly Val Ser Glu Lys Ile Thr Val Asp Pro Ile Thr Leu Thr | | |
| 755 | 760 | 765 |
| Ala Thr Lys Gln Leu Gln Ser Asn Ser Asn Asn Val Gln Thr Gly Lys | | |
| 770 | 775 | 780 |
| Glu Val Thr Thr Tyr Thr Pro Ser Gln Gln Pro Ile Gln Ile Thr Leu | | |
| 785 | 790 | 795 |
| Phe Asp Glu Ala Gly His Leu Gln Ser Cys His Thr Leu Thr Arg Asp | | |
| 805 | 810 | 815 |
| Gly Trp Asp Arg Val Arg Lys Glu Thr Asp Ala Ile Gly Gln Cys Thr | | |
| 820 | 825 | 830 |
| Ile Tyr Gln Tyr Asp Asn Tyr Asn Arg Val Ile Gln Ile Thr Leu Pro | | |
| 835 | 840 | 845 |
| Asp Gly Thr Ile Val Asn Arg Lys Tyr Ala Pro Phe Ser Thr Asp Thr | | |
| 850 | 855 | 860 |
| Leu Ile Thr Asp Ile Arg Val Asn Gly Ile Ser Leu Gly Gln Gln Thr | | |
| 865 | 870 | 875 |
| Phe Asp Gly Leu Ser Arg Leu Thr Gln Ser Gln Asp Gly Gly Arg Val | | |
| 885 | 890 | 895 |
| Trp Ala Tyr Thr Tyr Ser Ala Gly Asn Asp Gln Cys Pro Ser Thr Val | | |
| 900 | 905 | 910 |
| Ile Thr Pro Asp Gly Gln Phe Ile His Tyr Gln Tyr Gln Pro Glu Leu | | |
| 915 | 920 | 925 |
| Asp Asp Ala Val Leu Gln Val Ala Ser Asn Glu Ile Thr Gln Gln Phe | | |
| 930 | 935 | 940 |
| Ser Tyr Asn Pro Val Thr Gly Ala Leu Leu Lys Ala Val Ala Glu Gly | | |
| 945 | 950 | 955 |
| Gln Ser Leu Thr Pro Ile Tyr Tyr Pro Ser Gly Arg Leu Lys Met Glu | | |
| 965 | 970 | 975 |
| Asn Ile Asn Asp Met Lys Lys Met Ser Tyr Leu Trp Thr Leu Arg Gly | | |
| 980 | 985 | 990 |
| Leu Glu Asn Gly Tyr Thr Asp Leu Thr Gly Thr Ile Gln Lys Ile Ser | | |
| 995 | 1000 | 1005 |
| Arg Asp Thr His Gly Arg Val Thr Gln Ile Lys Asp Ser Ser Ile Lys | | |
| 1010 | 1015 | 1020 |
| Thr Thr Leu Asn Tyr Asp Asp Leu Asn Arg His Ile Gly Ser Gln Val | | |
| 1025 | 1030 | 1035 |
| | | 1040 |

Thr Asp Leu Ala Thr Gly His Met Leu Thr Thr Thr Val Glu Phe Asp
 1045 1050 1055
 Gly Leu Asn Arg Glu Ile Gly Arg Lys Leu Cys Asp Ser Ser Gly His
 1060 1065 1070
 Thr Leu Asp Ile Gln Gln Ser Trp Leu Lys Thr Gln Gln Leu Ala Asn
 1075 1080 1085
 Arg Ile Val Lys Leu Asn Gly Val Leu Gln Arg Thr Glu Gln Tyr Ser
 1090 1095 1100
 Tyr Asp Ser Arg Asn Arg Leu Asn Gln Tyr Lys Cys Asp Gly Ala Glu
 1105 1110 1115 1120
 Cys Pro Thr Asp Lys Tyr Gly His Ser Ile Val Thr Gln Asn Phe Thr
 1125 1130 1135
 Tyr Asp Ile Tyr Gly Asn Ile Thr Ala Cys His Thr Thr Phe Ala Asp
 1140 1145 1150
 Gly Thr Glu Asp His Ala Thr Phe Lys Phe Ala Asn Pro Thr Asp Pro
 1155 1160 1165
 Cys Gln Leu Thr Glu Val His His Thr His Pro Asp Met Pro Asp Asn
 1170 1175 1180
 Ile Arg Leu Lys Tyr Asp Lys Ala Gly Arg Val Ile Asn Ile Thr Asp
 1185 1190 1195 1200
 Asn His Gly Asn Thr Glu Asn Phe Thr Tyr Asp Thr Leu Gly Arg Leu
 1205 1210 1215
 Gln Asn Gly Gln Gly Ser Val Tyr Gly Tyr Asp Pro Leu Asn Arg Leu
 1220 1225 1230
 Val Ser Gln Lys Thr Asp Thr Leu Asp Cys Glu Leu Tyr Tyr Arg Glu
 1235 1240 1245
 Thr Met Leu Val Asn Glu Val Arg Asn Gly Glu Met Ile Arg Leu Leu
 1250 1255 1260
 Arg Thr Gly Glu Thr Ile Ile Ala Gln Gln Arg Ala Ser Lys Val Leu
 1265 1270 1275 1280
 Leu Thr Gly Thr Asp Ser Gln Gln Ser Val Ile Leu Thr Ser Asp Lys
 1285 1290 1295
 Gln Asn Leu Ser Gln Glu Ala Tyr Ser Ala Tyr Gly Lys His Lys Ser
 1300 1305 1310
 Thr Ala Asn Asp Ala Ser Ile Leu Gly Tyr Asn Gly Glu Arg Ala Asp
 1315 1320 1325
 Pro Val Ser Gly Val Thr His Leu Gly Asn Gly Tyr Arg Ser Tyr Asp
 1330 1335 1340
 Pro Thr Leu Met Arg Phe His Thr Pro Asp Ser Leu Ser Pro Phe Gly
 1345 1350 1355 1360
 Ala Gly Gly Ile Asn Pro Tyr Ser Tyr Cys Leu Gly Asp Pro Ile Asn
 1365 1370 1375
 Arg Ser Asp Pro Ser Gly His Leu Ser Trp Gln Ala Trp Thr Gly Ile
 1380 1385 1390
 Gly Met Gly Ile Ala Gly Leu Leu Leu Thr Ile Ala Thr Gly Gly Met
 1395 1400 1405
 Ala Ile Ala Ala Ala Gly Gly Ile Ala Ala Ala Ile Ala Ser Thr Ser
 1410 1415 1420
 Thr Thr Ala Leu Ala Phe Gly Ala Leu Ser Val Thr Ser Asp Ile Thr
 1425 1430 1435 1440
 Ser Ile Val Ser Gly Ala Leu Glu Asp Ala Ser Pro Lys Ala Ser Ser
 1445 1450 1455
 Ile Leu Gly Trp Val Ser Met Gly Met Gly Ala Ala Gly Leu Ala Glu
 1460 1465 1470
 Ser Ala Ile Lys Gly Gly Thr Lys Leu Ala Thr His Leu Gly Ala Phe
 1475 1480 1485
 Ala Glu Asp Gly Glu Asn Ala Leu Leu Lys Ser Thr Ser Glu Ser Ser

| | | |
|---|------|------|
| 1490 | 1495 | 1500 |
| Arg Ile Lys Trp Gly Val Thr Arg Ser Leu Asp Arg Glu Ile Val Arg | | |
| 1505 | 1510 | 1515 |
| Asn Glu Glu Gly Gln Val Ile Lys Asp His Ser Arg Gly Tyr Thr Asp | | 1520 |
| 1525 | 1530 | 1535 |
| Asn Phe Met Gly Lys Gly Glu Gln Ala Ile Leu Val His Gly Asp Lys | | |
| 1540 | 1545 | 1550 |
| Asp Gly Phe Leu Tyr His Thr Glu Gly Asn Lys His Asn Gly Lys Gly | | |
| 1555 | 1560 | 1565 |
| Pro Tyr Thr Arg His Thr Pro Glu Gln Leu Val Asp Tyr Leu Lys Asp | | |
| 1570 | 1575 | 1580 |
| Asn Asn Ile Val Asp Leu Thr Gln Gly Asp Lys Pro Val His Leu | | |
| 1585 | 1590 | 1595 |
| Leu Ser Cys Tyr Gly Lys Ser Ser Gly Ala Ala Asp Lys Met Ala Lys | | 1600 |
| 1605 | 1610 | 1615 |
| Tyr Ile Asn Arg Pro Val Ile Ala Tyr Ser Asn Lys Pro Thr Ile Ser | | |
| 1620 | 1625 | 1630 |
| Gln Gly Leu Ala Arg Ile Glu Arg Lys Asp Phe Phe Leu Lys Ser Thr | | |
| 1635 | 1640 | 1645 |
| Tyr His Ser Tyr Asp Pro Arg Lys Ile Ile Leu Gly Arg Thr Glu Lys | | |
| 1650 | 1655 | 1660 |
| Thr Val Lys Pro Lys Thr Phe Arg Pro | | |
| 1665 | 1670 | |

<210> 24

<211> 105

<212> PRT

<213> Xenorhabdus bovienii

<400> 24

| | | |
|---|-----|----|
| Leu Cys Tyr Gly His Ile Cys Leu Ser Gly Ile Pro His Arg His Ile | | |
| 1 | 5 | 10 |
| Tyr Ile Gly Ser Thr Tyr Tyr Gly Asn Arg Lys Ser Thr Val Leu Tyr | | |
| 20 | 25 | 30 |
| Ala Ala Ile Leu His Ser Val Ser Leu Phe Tyr Leu Leu Ile Ala Val | | |
| 35 | 40 | 45 |
| Phe Ser Ala Ser Ser Ala Gly Tyr Leu Thr Tyr Gly Leu Ser Tyr His | | |
| 50 | 55 | 60 |
| Thr Ile Ser Val Gln Phe Leu Gly Leu Ser His Gln Ile Pro Leu Leu | | |
| 65 | 70 | 75 |
| Leu Ser Thr Tyr Asp Gln Ser Leu Asn Leu Leu Leu Asp Tyr Gln Tyr | | 80 |
| 85 | 90 | 95 |
| Gly Asp Ser Gly His Arg Asn Leu Glu | | |
| 100 | 105 | |

<210> 25

<211> 129

<212> PRT

<213> Xenorhabdus bovienii

<400> 25

| | | |
|---|----|----|
| Ser Ala Gln Cys Ile Val Gly Lys Val Phe Arg Ile Ser Met Val Ile | | |
| 1 | 5 | 10 |
| Ser Asp Ile Tyr Tyr Ser Thr Ser Leu Ile Ile Phe Gln Pro Asp Ile | | |
| 20 | 25 | 30 |
| Ile Arg His Ile Trp Met Ser Val Val Tyr Leu Cys Gln Leu Ala Trp | | |
| 35 | 40 | 45 |

Val Ser Trp Val Gly Lys Phe Glu Gly Ser Met Val Phe Cys Pro Ile
 50 55 60
 Cys Glu Cys Gly Val Thr Gly Asp Ile Ala Ile Asp Ile Ile Ser
 65 70 75 80
 Lys Ile Leu Cys Asp Tyr Ala Met Ala Ile Phe Val Cys Arg Ala Phe
 85 90 95
 Arg Thr Val Thr Phe Ile Leu Val Gln Pro Ile Thr Gly Ile Val Arg
 100 105 110
 Val Leu Phe Cys Thr Leu Gln Tyr Ser Ile Gln Phe His Tyr Ser Ile
 115 120 125
 Cys

<210> 26
 <211> 141
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 26
 Pro Ser Ser Leu Arg Thr Ile Ser Leu Ser Lys Leu Leu Val Thr Pro
 1 5 10 15
 His Phe Ile Leu Glu Leu Ser Glu Val Asp Leu Ser Lys Ala Phe Ser
 20 25 30
 Pro Ser Ser Ala Asn Ala Pro Arg Cys Val Ala Ser Leu Val Pro Pro
 35 40 45
 Leu Met Ala Asp Ser Ala Asn Pro Ala Ala Pro Ile Pro Ile Glu Thr
 50 55 60
 His Pro Ser Ile Glu Asp Ala Phe Gly Glu Ala Ser Ser Ser Ala Pro
 65 70 75 80
 Leu Thr Ile Asp Val Ile Ser Asp Val Thr Leu Ser Ala Pro Asn Ala
 85 90 95
 Ser Ala Val Val Glu Val Glu Ala Ile Ala Ala Ala Ile Pro Pro Ala
 100 105 110
 Ala Ala Ile Ala Ile Pro Pro Val Ala Met Val Ser Ser Asn Pro Ala
 115 120 125
 Ile Pro Met Pro Ile Pro Val His Ala Cys Gln Leu Lys
 130 135 140

<210> 27
 <211> 101
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 27
 Ala His Cys His Ile Ala Leu Phe Pro Cys Trp His Asn Pro Gln Tyr
 1 5 10 15
 Cys Gln Gln His Pro Asp His His Ser Asn Cys His His Gln Phe Lys
 20 25 30
 Gln Glu Tyr Pro Pro Ser Arg Gln Arg Arg Glu Asn Ile Thr Leu Thr
 35 40 45
 Gln Leu Pro Ile Lys His Thr Gly Ile Glu Ala Gly Ser Gln Thr Asn
 50 55 60
 Arg Lys Arg Gln Thr Cys Met Phe Gln Arg Ala Asn Glu Ser Lys Val
 65 70 75 80
 His Gln Leu Gly Gln Asn Gln Gly Arg Asp Arg Asn Phe Tyr Trp Cys
 85 90 95
 Phe Asp Ile Leu Thr

100

<210> 28
<211> 117
<212> PRT
<213> Xenorhabdus bovienii

<400> 28
Pro Gln Ser Thr Pro Ser Ser Gln Asn Ser Arg Gln Leu Thr Pro Ala
1 5 10 15
Glu Ser Ser Gln His Gln Lys Gln Lys Ser Asp His Ile Glu Ile Met
20 25 30
Ile Pro Ser Glu Ala Pro Arg Glu Tyr Arg Glu Gln Leu His Lys Ala
35 40 45
Thr Pro Ala Arg Asn Arg Asp Val Ala Pro Asn Pro Ser Val Phe Asp
50 55 60
Ile Leu Arg Asp Tyr His Trp Lys Asn Phe Ser Pro Val Lys Ala Ala
65 70 75 80
Lys Ser Ser Leu Thr Pro His Pro Val His Gln Lys Ala Ile Pro Leu
85 90 95
Asn Asp Gln Arg Asn Thr Ser Met Lys Gln Ser Leu Lys Pro Glu Met
100 105 110
Arg Gln Lys Leu Tyr
115

<210> 29
<211> 124
<212> PRT
<213> Xenorhabdus bovienii

<400> 29
Gly Lys Asn Cys Ile Asn Asp Gln Gly Asn Leu Pro Asp Arg Tyr Thr
1 5 10 15
Gln Asn Cys Arg Pro His Leu Thr Asp Asn Pro Pro Tyr Gly Thr Val
20 25 30
Thr Glu Arg Asn Pro Arg Gln Tyr Gln His Ala Asp Leu Phe Gln Met
35 40 45
Arg Lys Leu Ile Gly Gln Leu Gln Asn Pro Ser Gly Asn Asn Gly Pro
50 55 60
Thr Gln Arg Gln His Trp Arg Ile Ala Ile Arg Ser His Lys Gln Cys
65 70 75 80
Lys Asn Asp His Thr Asp Ile Glu Gln Cys Arg Ser Lys Ser Arg His
85 90 95
Arg Lys Ala Val Pro Cys Ile Lys Asn Cys Ala Ser Gln Arg Ser Gln
100 105 110
Arg Asn Gln Lys Asp Ile Arg Lys Arg Asn Ser Lys
115 120

<210> 30
<211> 515
<212> PRT
<213> Xenorhabdus bovienii

<400> 30
Asn Asn Thr Met Asn Leu Leu Lys Ser Leu Ala Ala Val Ser Ser Met
1 5 10 15
Thr Met Phe Ser Arg Val Leu Gly Phe Ile Arg Asp Ala Ile Ile Ala

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 20 | 25 | 30 | | | | | | | | | | | | |
| Arg | Ile | Phe | Gly | Ala | Gly | Met | Ala | Thr | Asp | Ala | Phe | Phe | Val | Ala | Phe |
| | | | | | | 35 | | | 40 | | | | | | 45 |
| Lys | Leu | Pro | Asn | Leu | Leu | Arg | Arg | Ile | Phe | Ala | Glu | Gly | Ala | Phe | Ser |
| | | | | | | 50 | | | 55 | | | | | | 60 |
| Gln | Ala | Phe | Val | Pro | Ile | Leu | Ala | Glu | Tyr | Lys | Asn | Gln | Gln | Gly | Asp |
| | | | | | | 65 | | | 70 | | | | | | 80 |
| Glu | Ala | Thr | Arg | Thr | Phe | Ile | Ala | Tyr | Ile | Ser | Gly | Met | Leu | Thr | Leu |
| | | | | | | 85 | | | 90 | | | | | | 95 |
| Ile | Leu | Ala | Ile | Val | Ser | Val | Ile | Gly | Val | Ile | Ala | Ala | Pro | Trp | Ile |
| | | | | | | 100 | | | 105 | | | | | | 110 |
| Ile | Tyr | Val | Thr | Ala | Pro | Gly | Phe | Thr | Asp | Thr | Pro | Asp | Lys | Phe | Val |
| | | | | | | 115 | | | 120 | | | | | | 125 |
| Leu | Thr | Arg | Asp | Leu | Leu | Arg | Ile | Thr | Phe | Pro | Tyr | Ile | Phe | Leu | Ile |
| | | | | | | 130 | | | 135 | | | | | | 140 |
| Ser | Leu | Ala | Ser | Leu | Ala | Gly | Ala | Ile | Leu | Asn | Thr | Trp | Asn | Arg | Phe |
| | | | | | | 145 | | | 150 | | | | | | 160 |
| Ser | Val | Pro | Ala | Phe | Ala | Pro | Thr | Leu | Leu | Asn | Val | Ser | Met | Ile | Ile |
| | | | | | | 165 | | | 170 | | | | | | 175 |
| Phe | Ala | Leu | Phe | Val | Ala | Pro | Tyr | Cys | Asn | Pro | Pro | Val | Leu | Ala | Leu |
| | | | | | | 180 | | | 185 | | | | | | 190 |
| Gly | Trp | Ala | Val | Val | Ala | Gly | Gly | Val | Leu | Gln | Leu | Ala | Tyr | Gln | Leu |
| | | | | | | 195 | | | 200 | | | | | | 205 |
| Pro | His | Leu | Lys | Lys | Ile | Gly | Met | Leu | Val | Leu | Pro | Arg | Ile | Ser | Phe |
| | | | | | | 210 | | | 215 | | | | | | 220 |
| Arg | Asp | Ser | Ala | Val | Trp | Arg | Val | Ile | Arg | Gln | Met | Gly | Pro | Ala | Ile |
| | | | | | | 225 | | | 230 | | | | | | 240 |
| Leu | Gly | Val | Ser | Val | Gly | Gln | Ile | Ser | Leu | Ile | Ile | Asn | Thr | Ile | Phe |
| | | | | | | 245 | | | 250 | | | | | | 255 |
| Ala | Ser | Phe | Leu | Val | Ser | Gly | Ser | Val | Ser | Trp | Met | Tyr | Tyr | Ala | Asp |
| | | | | | | 260 | | | 265 | | | | | | 270 |
| Arg | Leu | Met | Glu | Leu | Pro | Ser | Gly | Val | Leu | Gly | Val | Ala | Leu | Gly | Thr |
| | | | | | | 275 | | | 280 | | | | | | 285 |
| Ile | Leu | Leu | Pro | Ser | Leu | Ala | Lys | Ser | Phe | Ser | Ser | Gly | Asn | His | Glu |
| | | | | | | 290 | | | 295 | | | | | | 300 |
| Glu | Tyr | Arg | Lys | Leu | Met | Asp | Trp | Gly | Leu | Arg | Leu | Cys | Phe | Leu | Leu |
| | | | | | | 305 | | | 310 | | | | | | 320 |
| Ala | Leu | Pro | Cys | Ala | Val | Ala | Leu | Gly | Ile | Leu | Ala | Glu | Pro | Leu | Thr |
| | | | | | | 325 | | | 330 | | | | | | 335 |
| Val | Ser | Leu | Phe | Gln | Tyr | Gly | His | Phe | Ser | Ala | Phe | Asp | Ala | Glu | Met |
| | | | | | | 340 | | | 345 | | | | | | 350 |
| Thr | Gln | Arg | Ala | Leu | Ile | Ala | Tyr | Cys | Phe | Gly | Leu | Met | Gly | Leu | Ile |
| | | | | | | 355 | | | 360 | | | | | | 365 |
| Val | Val | Lys | Val | Leu | Ala | Pro | Gly | Phe | Tyr | Ser | Arg | Gln | Asp | Ile | Lys |
| | | | | | | 370 | | | 375 | | | | | | 380 |
| Thr | Pro | Val | Lys | Ile | Ala | Ile | Ala | Thr | Leu | Ile | Leu | Thr | Gln | Leu | Met |
| | | | | | | 385 | | | 390 | | | | | | 400 |
| Asn | Leu | Ala | Phe | Val | Gly | Pro | Leu | Lys | His | Ala | Gly | Leu | Ala | Leu | Ser |
| | | | | | | 405 | | | 410 | | | | | | 415 |
| Ile | Gly | Leu | Ala | Ala | Cys | Phe | Asn | Ala | Ser | Met | Leu | Tyr | Trp | Gln | Leu |
| | | | | | | 420 | | | 425 | | | | | | 430 |
| Arg | Lys | Arg | Asp | Ile | Phe | Thr | Pro | Leu | Ala | Gly | Trp | Gly | Ile | Phe | Leu |
| | | | | | | 435 | | | 440 | | | | | | 445 |
| Phe | Lys | Leu | Val | Val | Ala | Ile | Ala | Val | Met | Val | Gly | Val | Leu | Leu | Ala |
| | | | | | | 450 | | | 455 | | | | | | 460 |
| Val | Leu | Trp | Val | Met | Pro | Ala | Trp | Glu | Gln | Gly | Asn | Met | Ala | Met | Arg |
| | | | | | | 465 | | | 470 | | | | | | 480 |

Leu Leu Arg Leu Met Gly Val Val Ile Ala Gly Ala Gly Ser Tyr Phe
 485 490 495
 Ala Val Leu Ala Leu Met Gly Phe Arg Leu Lys Asp Phe Ala His Arg
 500 505 510
 Gly Leu Gln
 515

<210> 31
 <211> 216
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 31

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Ile | Ile | Leu | Ile | Arg | Asp | Lys | Leu | Ser | Arg | Ile | Phe | Ser | Arg | Gln |
| 1 | | | | 5 | | | | 10 | | | | | 15 | | |
| Ile | Ser | Gly | Glu | Gly | Met | Phe | Gly | Tyr | Arg | Ser | Ala | Ser | Pro | Lys | Ile |
| | | | | | 20 | | | 25 | | | | | 30 | | |
| Arg | Phe | Ile | Thr | Asp | Arg | Met | Val | Val | Arg | Leu | Val | Tyr | Glu | Arg | Asp |
| | | | | | 35 | | | 40 | | | | 45 | | | |
| Ala | Tyr | Arg | Leu | Ala | Glu | Tyr | Tyr | Ser | Glu | Asn | Lys | Asp | Phe | Leu | Lys |
| | | | | | 50 | | | 55 | | | 60 | | | | |
| Pro | Trp | Glu | Pro | Thr | Arg | Asp | Gly | Ser | Phe | Tyr | Gln | Pro | Ser | Gly | Trp |
| | | | | | 65 | | | 70 | | 75 | | | 80 | | |
| Thr | Asn | Arg | Leu | Asn | Tyr | Ile | Ala | Glu | Leu | Gln | Arg | Gln | Asn | Ala | Thr |
| | | | | | | 85 | | | 90 | | | 95 | | | |
| Phe | Asn | Phe | Val | Leu | Leu | Asp | Ser | Asp | Glu | Arg | Glu | Ile | Met | Gly | Val |
| | | | | | 100 | | | 105 | | | 110 | | | | |
| Ala | Asn | Phe | Thr | Asn | Val | Val | Arg | Gly | Ala | Phe | His | Ser | Cys | Tyr | Leu |
| | | | | | 115 | | | 120 | | | 125 | | | | |
| Gly | Tyr | Ser | Leu | Ala | Glu | Lys | Leu | Gln | Gly | Gln | Gly | Leu | Met | Tyr | Glu |
| | | | | | 130 | | | 135 | | | 140 | | | | |
| Ala | Leu | Gln | Pro | Ala | Ile | Arg | Tyr | Met | Gln | Arg | Tyr | Gln | Arg | Met | His |
| | | | | | 145 | | | 150 | | 155 | | | 160 | | |
| Arg | Ile | Met | Ala | Asn | Tyr | Met | Pro | His | Asn | His | Arg | Ser | Gly | Asn | Leu |
| | | | | | | 165 | | | 170 | | | 175 | | | |
| Leu | Lys | Lys | Leu | Gly | Phe | Glu | Gln | Glu | Gly | Tyr | Ala | Lys | Asn | Tyr | Leu |
| | | | | | 180 | | | 185 | | | 190 | | | | |
| Met | Ile | Asp | Gly | Val | Trp | Gln | Asp | His | Val | Leu | Thr | Ala | Leu | Thr | Asp |
| | | | | | 195 | | | 200 | | | 205 | | | | |
| Asp | Ala | Trp | Gly | Lys | Val | Gly | Leu | | | | | | | | |
| | | | | | 210 | | | 215 | | | | | | | |

<210> 32
 <211> 404
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 32

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Trp | Cys | Ala | Met | Ser | Leu | Val | Ser | Gln | Ala | Arg | Ser | Leu | Gly | Lys | Tyr |
| 1 | | | | | 5 | | | 10 | | | 15 | | | | |
| Phe | Leu | Leu | Phe | Asp | Asn | Leu | Leu | Val | Val | Leu | Gly | Phe | Phe | Val | Val |
| | | | | | | 20 | | | 25 | | | 30 | | | |
| Phe | Pro | Leu | Ile | Ser | Ile | Arg | Phe | Val | Glu | Gln | Leu | Gly | Trp | Ala | Ala |
| | | | | | | 35 | | | 40 | | | 45 | | | |
| Leu | Ile | Val | Gly | Phe | Ala | Leu | Gly | Leu | Arg | Gln | Leu | Val | Gln | Gln | Gly |
| | | | | | | 50 | | | 55 | | | 60 | | | |
| Leu | Gly | Ile | Phe | Gly | Gly | Ala | Ile | Ala | Asp | Arg | Phe | Gly | Ala | Lys | Pro |

| | | | |
|---|-----|-----|-----|
| 65 | 70 | 75 | 80 |
| Met Ile Val Thr Gly Met Leu Leu Arg Ala Leu Gly Phe Ala Leu Met | | | |
| 85 | 90 | 95 | |
| Ala Met Ala His Glu Pro Trp Ile Leu Leu Leu Ser Cys Val Leu Ser | | | |
| 100 | 105 | 110 | |
| Gly Leu Gly Gly Thr Leu Phe Asp Pro Pro Arg Ala Ala Leu Val Ile | | | |
| 115 | 120 | 125 | |
| Lys Leu Thr Arg Pro His Glu Arg Gly Arg Phe Tyr Ser Ile Leu Met | | | |
| 130 | 135 | 140 | |
| Met Gln Asp Ser Ala Gly Ala Val Val Gly Ala Leu Ile Gly Ser Trp | | | |
| 145 | 150 | 155 | 160 |
| Leu Leu Gln Tyr Asp Phe Asn Ile Val Cys Trp Ile Gly Ala Ser Ile | | | |
| 165 | 170 | 175 | |
| Phe Val Leu Ala Ala Leu Phe Asn Ala Trp Leu Leu Pro Ala Tyr Arg | | | |
| 180 | 185 | 190 | |
| Ile Ser Thr Ile Arg Thr Pro Ile Lys Glu Gly Met Met Arg Val Ile | | | |
| 195 | 200 | 205 | |
| Arg Asp Arg Arg Phe Leu Tyr Tyr Val Leu Thr Leu Thr Gly Tyr Phe | | | |
| 210 | 215 | 220 | |
| Val Leu Ser Val Gln Val Met Leu Met Phe Pro Ile Ile His Glu | | | |
| 225 | 230 | 235 | 240 |
| Ile Thr Gly Thr Pro Thr Ala Val Lys Trp Met Tyr Ala Ile Glu Thr | | | |
| 245 | 250 | 255 | |
| Ala Ile Ser Leu Thr Leu Leu Tyr Pro Ile Ala Arg Trp Ser Glu Lys | | | |
| 260 | 265 | 270 | |
| His Phe Arg Leu Glu Gln Arg Leu Met Ala Gly Leu Phe Leu Met Ser | | | |
| 275 | 280 | 285 | |
| Ile Cys Met Phe Pro Ile Gly Trp Val Asn Gln Leu His Thr Leu Phe | | | |
| 290 | 295 | 300 | |
| Gly Leu Leu Cys Leu Phe Tyr Leu Gly Leu Val Thr Ala Asp Pro Ala | | | |
| 305 | 310 | 315 | 320 |
| Arg Glu Thr Leu Ser Ala Ser Leu Ser Asp Pro Arg Ala Arg Gly Ser | | | |
| 325 | 330 | 335 | |
| Tyr Met Gly Phe Ser Arg Leu Gly Leu Ala Leu Gly Gly Ala Ile Gly | | | |
| 340 | 345 | 350 | |
| Tyr Thr Gly Gly Trp Leu Tyr Asp Thr Gly Arg Asp Leu Asn Met | | | |
| 355 | 360 | 365 | |
| Pro Gln Leu Pro Trp Ile Leu Leu Gly Leu Ser Gly Leu Ile Thr Ile | | | |
| 370 | 375 | 380 | |
| Tyr Ala Leu His Arg Gln Phe Asn Gln Lys Lys Ile Asp Pro Val Met | | | |
| 385 | 390 | 395 | 400 |
| Leu Gly Arg His | | | |

<210> 33
<211> 191
<212> PRT
<213> Xenorhabdus bovienii

<400> 33

| | | | |
|---|----|----|----|
| Lys Gly Ala Asn Met Lys Arg Phe Phe Leu Gly Ala Ala Leu Val Leu | | | |
| 1 | 5 | 10 | 15 |
| Val Gly Leu Val Ser Gly Cys Asp Gln Phe Lys Asp Phe Ser Ile Asn | | | |
| 20 | 25 | 30 | |
| Glu Gly Leu Met Asn Asp Tyr Leu Leu Lys Lys Val His Tyr Gln Lys | | | |
| 35 | 40 | 45 | |
| Lys Ile Ser Ile Pro Gly Ile Ala Asn Ala Asn Ile Thr Leu Gly Asp | | | |

| | | |
|---|-----|-----|
| 50 | 55 | 60 |
| Leu Ser Ser Gln Ile Gly Arg Gln Asp Pro Glu Lys Ile Glu Leu Ser | | |
| 65 | 70 | 75 |
| Thr Gln Ala Lys Val Gln Leu Ala Thr Leu Leu Gly Thr Ile Gln Ala | | 80 |
| 85 | 90 | 95 |
| Asp Met Lys Leu Thr Ile Lys Ala Lys Pro Val Phe Asp Ala Glu Lys | | |
| 100 | 105 | 110 |
| Gly Ala Ile Phe Val Lys Gly Leu Glu Ile Val Asp Tyr Gln Thr Thr | | |
| 115 | 120 | 125 |
| Pro Glu Lys Ala Ala Ala Pro Val Lys Ala Leu Ile Pro Tyr Leu Asn | | |
| 130 | 135 | 140 |
| Thr Ser Leu Ser Glu Phe Phe Asp Thr His Pro Val Tyr Val Leu Asn | | |
| 145 | 150 | 155 |
| Pro Glu Lys Ser Lys Ala Glu Ala Ala Ala Ser Gln Phe Ala Lys Arg | | 160 |
| 165 | 170 | 175 |
| Leu Glu Ile Lys Pro Gly Lys Leu Val Ile Gly Leu Thr Asp Lys | | |
| 180 | 185 | 190 |

<210> 34

<211> 205

<212> PRT

<213> Xenorhabdus bovienii

<400> 34

| | | |
|---|-----|-----|
| Gln Val Ala Leu Gln His Gly Arg Arg Leu Gly Thr Ile Thr Leu Phe | | |
| 1 | 5 | 10 |
| Asp Asn Leu Leu Gly Leu Asn Gln Val Met Asn Glu Phe Ser Ile Val | | 15 |
| 20 | 25 | 30 |
| Cys Arg Ile Leu Gly Thr Leu Phe Asn Arg Ala Pro Gln Asp Pro Val | | |
| 35 | 40 | 45 |
| Leu Gln Pro Leu Ile Thr Met Ile Ala Glu Gly Lys Leu Lys Gln Ala | | |
| 50 | 55 | 60 |
| Trp Pro Leu Glu Gln Asp Glu Trp Leu Asp Arg Leu Gln Gln Asn Ser | | |
| 65 | 70 | 75 |
| Glu Leu Ser Val Met Ala Ala Asp Tyr His Ala Leu Phe Thr Gly Glu | | 80 |
| 85 | 90 | 95 |
| Ser Ala Ser Val Ala Val Cys Arg Ser Asp Tyr Thr Asp Gly Glu Glu | | |
| 100 | 105 | 110 |
| Ser Glu Val Arg Gln Phe Leu Thr Glu Arg Gly Met Pro Leu Ser Asp | | |
| 115 | 120 | 125 |
| Thr Pro Ala Asp Gln Phe Gly Ser Leu Leu Leu Ala Val Ser Trp Leu | | |
| 130 | 135 | 140 |
| Glu Asp Gln Ala Ala Glu Asp Glu Ile Gln Ala Gln Ile Thr Leu Phe | | |
| 145 | 150 | 155 |
| Asp Glu Tyr Leu Leu Pro Trp Cys Gly Gln Phe Leu Gly Lys Val Glu | | 160 |
| 165 | 170 | 175 |
| Ala His Ala Thr Ser Gly Phe Tyr Arg Thr Leu Ala Ile Val Thr Arg | | |
| 180 | 185 | 190 |
| Glu Ala Leu Gln Ala Leu Arg Asp Glu Leu Glu Ser Glu | | |
| 195 | 200 | 205 |

<210> 35

<211> 315

<212> PRT

<213> Xenorhabdus bovienii

<400> 35

Asp Cys Met Asn Ile Ile Phe Phe His Pro Ser Phe Asn Thr Asp Glu
 1 5 10 15
 Trp Ile Gln Gly Ile Gln Ala Arg Leu Pro Asp Ala Lys Val Arg Gln
 20 25 30
 Trp Val Ser Gly Asp Gln Glu Pro Ala Asp Tyr Ala Leu Val Trp Gln
 35 40 45
 Pro Pro Tyr Glu Met Leu Ala Asn Arg Gln Gly Leu Lys Gly Ile Phe
 50 55 60
 Ala Leu Gly Ala Gly Val Asp Ala Ile Phe Lys Gln Glu Ser Lys Asn
 65 70 75 80
 Pro Gly Thr Leu Leu Ala Asp Val Pro Leu Ile Arg Leu Glu Asp Thr
 85 90 95
 Gly Met Gly Arg Gln Met Gln Glu Tyr Ala Ile Thr Ser Val Leu His
 100 105 110
 Tyr Phe Arg Arg Met Asp Glu Tyr Lys Arg Tyr Gln Glu Gln Arg Leu
 115 120 125
 Trp Asn Pro Ile Ala Pro His Asn Arg Lys Glu Phe Val Ile Gly Val
 130 135 140
 Leu Gly Ala Gly Ile Leu Gly Arg Ser Val Ile Gly Lys Leu Met Glu
 145 150 155 160
 Phe Asp Phe Asn Val Arg Cys Trp Ser Arg Thr Ser Lys Gln Leu Asp
 165 170 175
 Ser Val Glu Ser Phe Tyr Gly Lys Glu Gln Leu Gly Asp Phe Leu Ser
 180 185 190
 Gly Cys Lys Val Leu Ile Asn Leu Pro Asp Thr Pro Asp Thr Arg
 195 200 205
 Gly Ile Leu Asn Leu Ser Leu Phe Ser Gln Leu Lys Ser Gly Ser Tyr
 210 215 220
 Val Ile Asn Leu Ala Arg Gly Ala Gln Leu Val Glu Gln Asp Leu Leu
 225 230 235 240
 Val Ala Ile Asp Lys Gly Tyr Ile Ala Gly Ala Thr Leu Asp Val Phe
 245 250 255
 Ala Glu Glu Pro Leu Ser Asn Met His Pro Phe Trp Thr His Pro Arg
 260 265 270
 Ile Asn Val Thr Pro His Ile Ala Ala Asn Thr Ile Pro Glu Ala Ala
 275 280 285
 Met Asp Val Ile Cys Glu Asn Ile Arg Arg Met Val Gln Gly Glu Met
 290 295 300
 Pro Thr Gly Leu Val Asp Arg Val Arg Gly Tyr
 305 310 315

<210> 36

<211> 132

<212> PRT

<213> Xenorhabdus bovienii

<400> 36

Lys Thr Ser Gln Gly Phe Thr Ser Thr Thr Cys Ser Asn Gly Asn Val
 1 5 10 15
 Leu Lys Ile Cys Gly Leu Ile Thr Pro Cys Ser Ser Leu Ile Gln Arg
 20 25 30
 Thr Tyr Pro Asn Asn Met Thr Ile Gly Ile Phe Ser Lys Glu Ser Thr
 35 40 45
 Ala Lys Asn Phe Gly Met Gly Phe Leu Tyr Tyr Phe Asp Leu Arg Val
 50 55 60
 Leu Ser Pro Phe Phe Lys Ala Pro Ile Asn Ile Phe Thr Gly Trp Gln
 65 70 75 80

His Asn Thr Asn Phe Arg Lys Ser Arg Asn Ser Thr Ile Arg Leu Cys
 85 90 95
 Ser Ser Thr Pro Asn Ser Lys Gln Tyr Phe Thr Thr Ser Arg Lys Cys
 100 105 110
 His Ile Thr Gly Ala Gly Lys Tyr Arg Phe Ser Ile Glu Asn Cys Phe
 115 120 125
 Ile Lys Ser Gly
 130

<210> 37

<211> 289

<212> PRT

<213> Xenorhabdus bovienii

<400> 37

Tyr Ser Ala Gly Cys Ser Thr Val Leu Lys Ser Ser Leu Asn Leu Gln
 1 5 10 15
 Cys Asp Thr Phe Asn Cys Glu Ser Phe Val Met Leu Thr Leu Asn Phe
 20 25 30
 Ser Thr Ser Val Asn Ala Lys Pro Ser His Ile Trp Ala His Tyr Val
 35 40 45
 Asp Phe Asp Leu Arg Lys Lys Trp Glu Val Asp Leu Glu Tyr Phe Gln
 50 55 60
 Phe Glu Gly Glu Val Lys Thr Gly Gln Tyr Gly Arg Met Ile Leu Ser
 65 70 75 80
 Gly Met Pro Glu Ile Arg Phe Tyr Leu Ser Asn Ile Glu Val Asn Lys
 85 90 95
 Glu Phe Thr Asp Gln Val Asn Leu Pro Gln Met Gly Ile Leu Thr Phe
 100 105 110
 Arg His Gln Ile Ile Thr Asp Glu Asn Asn Met Ala Cys Arg Val Gln
 115 120 125
 Val Thr Val Ser Phe Glu Pro Asp Ala Asn Ile Pro Ala Val Gln Ala
 130 135 140
 Glu Ser Phe Phe Lys Gln Gly Thr Gln Asp Leu Val Glu Ser Val Leu
 145 150 155 160
 Arg Leu Lys Ser Val Val Glu Thr Val Ser Pro Lys Pro Asn Leu Gln
 165 170 175
 Leu Val Tyr Val Ser Asp Ile Glu Ser Ser Thr Ala Phe Tyr Lys Thr
 180 185 190
 Ile Phe Asn Ala Glu Pro Ile Phe Ala Ser Ser Arg Tyr Val Ala Phe
 195 200 205
 Pro Ala Gly Gly Glu Val Leu Phe Ala Ile Trp Ser Gly Gly Ala Lys
 210 215 220
 Pro Asp Arg Ala Ile Pro Arg Phe Ser Glu Ile Gly Ile Met Leu Pro
 225 230 235 240
 Ser Gly Lys Asp Val Asp Arg Cys Phe Glu Glu Trp Arg Lys Asn Pro
 245 250 255
 Glu Ile Lys Ile Val Gln Glu Pro His Thr Glu Val Phe Gly Arg Thr
 260 265 270
 Phe Leu Ala Glu Asp Pro Asp Gly His Ile Ile Arg Val Cys Pro Leu
 275 280 285
 Asp

<210> 38

<211> 270

<212> PRT

<213> Xenorhabdus bovienii

<400> 38

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Gly | Asn | Gln | Ile | Thr | Met | Ile | Leu | Tyr | Lys | Gly | Ser | Lys | Asn | Tyr |
| 1 | | | | 5 | | | | 10 | | | | | | 15 | |
| Leu | Phe | Asn | Gln | Leu | Asn | Tyr | Asp | Ser | Cys | Val | Leu | Leu | Glu | Val | Asp |
| | | | | | 20 | | | 25 | | | | | 30 | | |
| Glu | Ser | Val | Asn | Leu | Asn | Gly | Trp | Asp | Glu | Leu | Ser | Arg | Ala | Gln | Arg |
| | | | | | 35 | | | 40 | | | | 45 | | | |
| Leu | Leu | Phe | Leu | Met | Glu | Ile | Leu | Arg | Arg | Tyr | His | Phe | Pro | Val | Gln |
| | | | | | 50 | | | 55 | | | 60 | | | | |
| Gly | Lys | Val | Leu | Ala | Gln | Lys | Leu | Asn | Ile | Ser | Leu | Arg | Thr | Leu | Tyr |
| | | | | | 65 | | | 70 | | | 75 | | 80 | | |
| Arg | Asp | Ile | Ala | Ser | Leu | Gln | Ala | Gln | Gly | Ala | Ile | Ile | Glu | Gly | Glu |
| | | | | | 85 | | | 90 | | | 95 | | | | |
| Pro | Gly | Ile | Gly | Tyr | Val | Leu | Arg | Pro | Gly | Phe | Val | Leu | Pro | Pro | Leu |
| | | | | | 100 | | | 105 | | | 110 | | | | |
| Met | Phe | Thr | Gln | Asn | Glu | Ile | Glu | Ala | Leu | Ala | Gly | Ala | Asn | Trp | |
| | | | | | 115 | | | 120 | | | 125 | | | | |
| Val | Ala | Lys | Arg | Ala | Asp | Pro | Gln | Leu | Lys | Glu | Ser | Ala | Asn | Asn | Ala |
| | | | | | 130 | | | 135 | | | 140 | | | | |
| Ile | Ser | Lys | Ile | Ala | Ala | Val | Ile | Pro | Ala | Glu | Leu | Lys | Gln | Met | Leu |
| | | | | | 145 | | | 150 | | | 155 | | 160 | | |
| Glu | Ala | Ser | Ser | Leu | Leu | Ile | Gly | Pro | Ala | Ala | Thr | Ala | Val | Gln | Pro |
| | | | | | 165 | | | 170 | | | 175 | | | | |
| Val | Val | Glu | Ile | Gln | Gln | Ile | Arg | Gln | Ala | Ile | Asn | Thr | Arg | His | Lys |
| | | | | | 180 | | | 185 | | | 190 | | | | |
| Ile | Thr | Leu | Ala | Tyr | Leu | Asp | Ile | Lys | Asp | Ile | Pro | Ser | Glu | Arg | Thr |
| | | | | | 195 | | | 200 | | | 205 | | | | |
| Ile | Trp | Pro | Phe | Ala | Leu | Gly | Tyr | Phe | Glu | Asn | Ile | Ser | Ile | Val | Ile |
| | | | | | 210 | | | 215 | | | 220 | | | | |
| Gly | Trp | Cys | Glu | Leu | Arg | Glu | Glu | Phe | Arg | His | Phe | Arg | Ser | Asp | Arg |
| | | | | | 225 | | | 230 | | | 235 | | 240 | | |
| Ile | Met | Arg | Leu | Lys | Ile | Glu | Asn | Gln | Cys | Tyr | Pro | Arg | Ser | Arg | Gln |
| | | | | | 245 | | | 250 | | | 255 | | | | |
| Val | Leu | Leu | Lys | Glu | Trp | Arg | Ala | Met | Glu | Lys | Ile | Ser | Arg | | |
| | | | | | 260 | | | 265 | | | 270 | | | | |

<210> 39

<211> 209

<212> PRT

<213> Xenorhabdus bovienii

<400> 39

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Arg | Lys | Met | Thr | Ile | Tyr | Asp | Leu | Lys | Pro | Arg | Phe | Gln | Asn | Leu | Leu |
| 1 | | | | 5 | | | | 10 | | | | 15 | | | |
| Arg | Pro | Ile | Val | Ile | Tyr | Leu | Tyr | Lys | Gln | Gly | Ile | Thr | Ala | Asn | Gln |
| | | | | 20 | | | | 25 | | | 30 | | | | |
| Val | Thr | Leu | Thr | Ala | Leu | Phe | Leu | Ser | Ile | Phe | Ala | Gly | Ser | Leu | Leu |
| | | | | | 35 | | | 40 | | | 45 | | | | |
| Ser | Leu | Phe | Pro | Ser | Pro | His | Leu | Tyr | Trp | Leu | Leu | Pro | Val | Phe | Leu |
| | | | | | 50 | | | 55 | | | 60 | | | | |
| Phe | Ile | Arg | Met | Ala | Leu | Asn | Ala | Ile | Asp | Gly | Met | Leu | Ala | Arg | Glu |
| | | | | | 65 | | | 70 | | | 75 | | 80 | | |
| His | Asn | Gln | Lys | Ser | His | Leu | Gly | Ala | Ile | Tyr | Asn | Glu | Leu | Gly | Asp |
| | | | | | 85 | | | 90 | | | 95 | | | | |
| Val | Ile | Ser | Asp | Val | Ala | Leu | Tyr | Leu | Pro | Phe | Cys | Leu | Leu | Pro | Asp |

| | | | |
|-------------------------|-------------------------|-------------------------|-----------------|
| | 100 | 105 | 110 |
| Val Asn Ser | Leu Ser Leu Leu | Ile Ile Leu Phe Leu | Thr Ile Leu Thr |
| 115 | 120 | 125 | |
| Glu Phe Ile Gly Val | Leu Ala Gln Thr Ile Gly | Ala Ser Arg Arg Tyr | |
| 130 | 135 | 140 | |
| Asp Gly Pro Ile Gly | Lys Ser Asp Arg Ala | Phe Ile Phe Gly Ala | Tyr |
| 145 | 150 | 155 | 160 |
| Gly Leu Ile Ile Ala | Ile Phe Pro Leu Ala | Leu Gly Trp Ser Ile | Ser |
| 165 | 170 | 175 | |
| Leu Phe Ala Phe Met | Ile Ile Leu Leu Val | Leu Thr Cys Tyr Gln Arg | |
| 180 | 185 | 190 | |
| Val Val Lys Ala Leu Arg | Glu Ile Arg Leu Ala | Glu Gln Ser His Ser | |
| 195 | 200 | 205 | |
| Lys | | | |

<210> 40
<211> 592
<212> PRT
<213> Xenorhabdus bovienii

| | | | |
|-------------------------|-------------------------|-------------------------|-----|
| | 40 | | |
| Gly Val Asn Met Thr Pro | Gln Leu Asp Gln Arg | Ile Ala Glu Glu His | |
| 1 | 5 | 10 | 15 |
| Tyr Phe Thr Thr Ser Asp | Asn Ala Ser Leu Phe | Tyr Arg Tyr Trp Pro | |
| 20 | 25 | 30 | |
| Gln Gln Gln Ala Asn Pro | Asp Arg Ala Ile Ile Ile | Phe His Arg Gly | |
| 35 | 40 | 45 | |
| His Glu His Ser Gly Arg | Ile Gln His Val Val | Asp Gly Leu Asp Leu | |
| 50 | 55 | 60 | |
| Pro Asp Val Pro Met Phe | Ala Trp Asp Ala Arg | Gly His Gly Lys Thr | |
| 65 | 70 | 75 | 80 |
| Glu Gly Pro Arg Gly Tyr | Ser Pro Ser Met | Gly Thr Ser Ile Arg Asp | |
| 85 | 90 | 95 | |
| Val Asp Glu Phe Val Arg | Phe Ile Ala Thr Gln Tyr | Gly Ile Ala Met | |
| 100 | 105 | 110 | |
| Glu Asn Ile Val Val Ile | Gly Gln Ser Val Gly | Ala Val Leu Val Ser | |
| 115 | 120 | 125 | |
| Ala Trp Val His Asp Tyr | Ala Pro Lys Ile Arg | Ala Met Ile Leu Ala | |
| 130 | 135 | 140 | |
| Ala Pro Ala Phe Asp | Ile Lys Leu Tyr Ile | Pro Phe Ala Thr Gln Gly | |
| 145 | 150 | 155 | 160 |
| Leu Gln Leu Met Gln Lys | Ala Arg Gly Ile Phe | Phe Val Asn Ser Tyr | |
| 165 | 170 | 175 | |
| Val Lys Ala Arg Tyr | Leu Thr His Asp Glu | Thr Arg Ile Ala Ser Tyr | |
| 180 | 185 | 190 | |
| Asn Ser Asp Pro Leu Ile | Thr Arg Glu Ile Ala | Val Asn Ile Leu Leu | |
| 195 | 200 | 205 | |
| Asp Leu Tyr Gln Thr Ala | Glu Arg Val Val | Lys Asp Ala Ala Ala Ile | |
| 210 | 215 | 220 | |
| Thr Leu Pro Thr Leu Leu | Phe Ile Ser Gly | Ser Asp Tyr Val Val Asn | |
| 225 | 230 | 235 | 240 |
| Lys Lys Pro Gln His | Gln Phe Tyr Gln Gln | Leu Asn Thr Pro Ile Lys | |
| 245 | 250 | 255 | |
| Glu Lys His Val Met Asp | Gly Phe Tyr His Asp | Thr Leu Gly Glu Lys | |
| 260 | 265 | 270 | |
| Asp Arg His Leu Val Phe | Asp Lys Ile Arg | Val Phe Glu Arg Ile | |

| 275 | 280 | 285 |
|-----------------------------|---------------------|-----------------------------|
| Phe Ala Leu Pro Arg Tyr | Gln His Asp Tyr Ser | Gln Glu Asp Thr Trp |
| 290 | 295 | 300 |
| Ser His Ser Ala Asp Glu | Phe Arg Thr Leu Ser | Thr Ser Leu Pro Cys |
| 305 | 310 | 315 320 |
| Leu Cys Pro Lys Lys | Leu Ser Tyr Gln | Leu Met Arg Lys Val Met Ser |
| 325 | 330 | 335 |
| Thr His Trp Gly Arg Thr Ser | Glu Gly Val Cys Ile | Gly Leu Lys Thr |
| 340 | 345 | 350 |
| Gly Phe Asp Ser Gly Ser | Thr Leu Asp Tyr Val | Tyr Arg Asn Gln Pro |
| 355 | 360 | 365 |
| Gln Gly Lys Gly Ile | Leu Gly Arg Ile | Leu Asp Lys His Tyr Leu Asn |
| 370 | 375 | 380 |
| Ser Ile Gly Trp Arg Gly | Ile Arg Gln Arg | Lys Ile His Ile Glu Met |
| 385 | 390 | 395 400 |
| Leu Ile Arg His Ala Ile | Arg Ser Leu Arg | Glu Gln Asn Met Pro Val |
| 405 | 410 | 415 |
| His Met Val Asp Ile Ala | Ala Gly His Gly Arg | Tyr Ile Leu Asp Ala |
| 420 | 425 | 430 |
| Ile Asn Asp Phe Ser Lys | Val Asp Ser Ile | Leu Leu Arg Asp Tyr Ser |
| 435 | 440 | 445 |
| Glu Ile Asn Val Asn Gln | Gly Gln Ala Tyr Ile | Glu Glu Arg Asp Leu |
| 450 | 455 | 460 |
| Thr Asp Lys Ile Arg Phe | Ile Ile Gly Asp Ala | Phe Asn Ala Glu Ser |
| 465 | 470 | 475 480 |
| Ile Ser Ser Ile Thr Pro | Ala Pro Thr Leu | Gly Ile Val Ser Gly Leu |
| 485 | 490 | 495 |
| Tyr Glu Leu Phe Pro Asp | Asn Asn Leu | Leu Arg Asn Ser Leu Arg Gly |
| 500 | 505 | 510 |
| Phe Ala Asp Val Met Thr | Glu Asn Gly Tyr | Leu Val Tyr Thr Gly Gln |
| 515 | 520 | 525 |
| Pro Trp His Pro Gln Ile | Glu Val Ile | Ala Arg Val Leu Ser Ser His |
| 530 | 535 | 540 |
| Arg Asp Ser Gln Pro Trp | Ile Met Arg Arg | Arg Thr Gln Gly Glu Met |
| 545 | 550 | 555 560 |
| Asp Ala Leu Val Glu | Ala Ala Gly Phe | Glu Lys Leu Tyr Gln Leu Thr |
| 565 | 570 | 575 |
| Asp Asn Trp Gly Ile Phe | Thr Val Ser Ile | Ala Lys Arg Val His Arg |
| 580 | 585 | 590 |

<210> 41
<211> 121
<212> PRT
<213> Xenorhabdus bovienii

<400> 41
His His Asn Ser Ile Asn Val Leu Leu Lys Asn Ile Ile Ser Pro His
1 5 10 15
Gln Ile Met Leu Leu Cys Phe Thr Val Thr Gly His Asn Asn Arg Pro
20 25 30
Ile Gln Thr Glu Arg Ser Leu Phe Phe Thr Val Val Met Ser Thr Gln
35 40 45
Asp Val Ser Ser Met Ser Leu Thr Asp Ser Ile Cys Leu Met Phe Leu
50 55 60
Cys Ser Arg Gly Met Pro Val Asp Thr Val Arg Gln Lys Gly Arg Ala
65 70 75 80
Val Thr Ala His Pro Trp Glu Arg Arg Phe Val Met Leu Met Asn Leu

| | | |
|---|-----|-----|
| 85 | 90 | 95 |
| Ser Asp Leu Leu Pro Leu Ser Thr Ala Ser Pro Trp Lys Ile Ser Trp | | |
| 100 | 105 | 110 |
| Leu Ser Ala Arg Val Ser Glu Arg Tyr | | |
| 115 | 120 | |

<210> 42
<211> 444
<212> PRT
<213> Xenorhabdus bovienii

| | | | |
|---|-----|-----|-----|
| <400> 42 | | | |
| Ile Asn Lys Tyr Lys Met Glu His His Met His Ser Ser Leu Asp Ser | | | |
| 1 | 5 | 10 | 15 |
| Arg Arg Arg Leu Trp Leu Thr Gly Val Ile Trp Leu Leu Phe Leu Ala | | | |
| 20 | 25 | 30 | |
| Pro Phe Phe Phe Leu Thr Tyr Gly Gln Val Asn Gln Phe Thr Ala Gln | | | |
| 35 | 40 | 45 | |
| Arg Ser Asp Val Gly Thr Val Met Phe Gly Trp Glu His Asn Ile Pro | | | |
| 50 | 55 | 60 | |
| Phe Trp Ser Trp Ser Ile Ile Pro Tyr Trp Ser Ile Asp Leu Phe Tyr | | | |
| 65 | 70 | 75 | 80 |
| Gly Ile Ser Leu Phe Ile Cys Thr His Arg Arg Glu Gln Trp Leu His | | | |
| 85 | 90 | 95 | |
| Gly Trp Arg Leu Met Thr Ala Ser Leu Ile Ala Cys Val Gly Phe Leu | | | |
| 100 | 105 | 110 | |
| Leu Phe Pro Leu Lys Phe Ser Phe Ser Arg Pro Thr Thr Glu Gly Leu | | | |
| 115 | 120 | 125 | |
| Phe Gly Trp Leu Phe Asn Gln Leu Glu Leu Phe Asp Leu Pro Tyr Asn | | | |
| 130 | 135 | 140 | |
| Gln Ala Pro Ser Leu His Ile Ile Leu Leu Trp Leu Leu Trp Leu Arg | | | |
| 145 | 150 | 155 | 160 |
| Tyr Ser Ala Tyr Val Ser Gly Tyr Trp Arg Gly Leu Leu His Ile Trp | | | |
| 165 | 170 | 175 | |
| Ser Val Leu Ile Ala Leu Ser Val Leu Thr Thr Trp Gln His His Phe | | | |
| 180 | 185 | 190 | |
| Ile Asp Val Leu Thr Gly Phe Ala Val Gly Val Ile Leu Ser Tyr Leu | | | |
| 195 | 200 | 205 | |
| Leu Pro Val Ser Tyr Arg Trp Arg Trp Gln Pro Asn Gln Asp Arg Tyr | | | |
| 210 | 215 | 220 | |
| Ala Arg Lys Leu Phe Gly Tyr Tyr Leu Thr Gly Ser Ala Leu Phe Ala | | | |
| 225 | 230 | 235 | 240 |
| Leu Ile Ala Ser Leu Leu Gly Gly Ser Phe Trp Ile Leu Leu Trp Pro | | | |
| 245 | 250 | 255 | |
| Ala Val Ser Leu Leu Met Ile Ala Leu Gly Tyr Ala Gly Leu Gly Ser | | | |
| 260 | 265 | 270 | |
| Ser Val Phe Gln Lys Gln Pro Asp Gly Arg Met Ser Leu Ser Ala Arg | | | |
| 275 | 280 | 285 | |
| Trp Leu Leu Ala Pro Tyr Gln Leu Gly Ala Trp Leu Ser Tyr Leu Trp | | | |
| 290 | 295 | 300 | |
| Phe Arg Arg Lys Ser Ala Pro Phe Asn His Ile Thr Glu Gly Ile Ile | | | |
| 305 | 310 | 315 | 320 |
| Leu Gly Ser Leu Pro Cys Gln Pro Val Thr Ala Val Ser Val Leu Asp | | | |
| 325 | 330 | 335 | |
| Ile Thr Ala Glu Trp His Arg Arg Ser Asp Ala Arg Thr Val Asn Tyr | | | |
| 340 | 345 | 350 | |
| Val Cys Gln Pro Gln Ile Asp Leu Leu Pro Leu Ala Pro Glu Ala Leu | | | |

| | | |
|---|-----|-----|
| 355 | 360 | 365 |
| Gln Ser Ala Val Cys Thr Leu Asp Lys Leu Arg Gln Gln Gly Asp Val | | |
| 370 | 375 | 380 |
| Phe Val His Cys Thr Leu Gly Leu Ser Arg Ser Ala Met Val Val Ala | | |
| 385 | 390 | 395 |
| Ala Trp Leu Leu Lys Gln His Pro Glu Tyr Asp Ile Asn Thr Val Val | | 400 |
| 405 | 410 | 415 |
| Ala Ile Leu Arg Lys Ala Arg Pro His Val Thr Phe Arg Gln Thr His | | |
| 420 | 425 | 430 |
| Leu Asp Ala Leu Ser Gln Trp Ala Lys Gly Tyr Leu | | |
| 435 | 440 | |

<210> 43

<211> 174

<212> PRT

<213> Xenorhabdus bovienii

<400> 43

| | | |
|---|-----|-----|
| Gln Ser Cys Val Lys Pro Asp Arg Met Ser Arg Ser Asp Lys His Ile | | |
| 1 | 5 | 10 |
| Trp Met Pro Cys Leu Asn Gly Gln Lys Ala Thr Tyr Asn Gly Glu His | | |
| 20 | 25 | 30 |
| Asn Met Gln Pro Glu Asn Leu Ile Ser Lys Val Ile Ile Ala Thr Leu | | |
| 35 | 40 | 45 |
| Lys Ser Trp Arg Phe Ile Ser Thr Leu Ser Ala Phe Ser Ile Leu Ile | | |
| 50 | 55 | 60 |
| Ala Thr Ala Met Leu Ile Ala Val Phe Asn Thr Thr Ala Leu Asn Asn | | |
| 65 | 70 | 75 |
| Ile Ala Leu Tyr Ala Val Leu Leu Phe Thr Thr Leu Tyr Cys Gln Tyr | | |
| 85 | 90 | 95 |
| Tyr Cys Trp Arg Thr Trp Leu Asp Cys His Tyr Phe Gln Ile Leu Asn | | |
| 100 | 105 | 110 |
| Ser Ser Pro Glu Lys Ser Ala Glu Phe Asp Gln Thr Leu Leu Leu Ile | | |
| 115 | 120 | 125 |
| Phe Asn Lys Leu Pro Gln Ser Arg Thr Gln Asn Asp Arg Phe Asn Gly | | |
| 130 | 135 | 140 |
| Ala Ile Lys Leu Leu Lys Lys Ala Thr Ile Gly Leu Ile Leu Gln Trp | | |
| 145 | 150 | 155 |
| Ile Leu Phe Phe Leu Phe Leu Leu Thr Leu Lys Tyr Ser Ala | | 160 |
| 165 | 170 | |

<210> 44

<211> 466

<212> PRT

<213> Xenorhabdus bovienii

<400> 44

| | | |
|---|----|----|
| Met Asn Thr Arg Lys Ile Asn Gly Ile Arg Pro Phe Ser Ala Phe Ile | | |
| 1 | 5 | 10 |
| Asp Ser Cys Leu Lys Glu Ser Tyr Ser Phe Pro Arg Phe Ile Arg Asp | | |
| 20 | 25 | 30 |
| Ile Ile Ala Gly Ile Thr Val Gly Val Ile Ala Ile Pro Leu Ala Met | | |
| 35 | 40 | 45 |
| Ala Leu Ala Ile Gly Ser Gly Val Ala Pro Gln Tyr Gly Leu Tyr Thr | | |
| 50 | 55 | 60 |
| Ala Ala Ile Ala Gly Ile Val Ile Ala Met Thr Gly Gly Ser Arg Tyr | | |
| 65 | 70 | 75 |
| | | 80 |

Ser Val Ser Gly Pro Thr Ala Ala Phe Val Val Ile Leu Tyr Pro Val
 85 90 95
 Ser Gln Gln Phe Gly Leu Ser Gly Leu Leu Ile Ala Thr Leu Met Ser
 100 105 110
 Gly Val Ile Leu Ile Val Met Gly Leu Ala Arg Phe Gly Arg Leu Ile
 115 120 125
 Glu Tyr Ile Pro Met Ser Val Thr Leu Gly Phe Thr Ser Gly Ile Ala
 130 135 140
 Ile Thr Ile Ala Thr Met Gln Val Gln Asn Phe Phe Gly Leu Lys Leu
 145 150 155 160
 Ala His Ile Pro Glu Asn Tyr Ile Asp Lys Val Val Ala Leu Tyr Gln
 165 170 175
 Ala Leu Pro Ser Leu Gln Leu Ser Asp Thr Leu Ile Gly Leu Thr Thr
 180 185 190
 Leu Leu Val Leu Ile Phe Trp Pro Lys Leu Gly Val Lys Leu Pro Gly
 195 200 205
 His Leu Pro Ala Leu Ile Ala Gly Thr Ala Val Met Gly Ala Met His
 210 215 220
 Leu Leu Asn His Asp Val Ala Thr Ile Gly Ser Ser Phe Ser Tyr Thr
 225 230 235 240
 Leu Ala Asp Gly Thr Gln Gly Gln Gly Ile Pro Pro Ile Leu Pro Gln
 245 250 255
 Phe Val Leu Pro Trp Asn Leu Pro Asp Thr His Ser Leu Asp Ile Ser
 260 265 270
 Trp Asn Thr Val Ser Ala Leu Leu Pro Ala Ala Phe Ser Met Ala Met
 275 280 285
 Leu Gly Ala Ile Glu Ser Leu Leu Cys Ala Val Ile Leu Asp Gly Met
 290 295 300
 Thr Gly Lys Lys His His Ser Asn Gly Glu Leu Leu Gly Gln Gly Leu
 305 310 315 320
 Gly Asn Ile Ala Ala Pro Phe Phe Gly Gly Ile Thr Ala Thr Ala Ala
 325 330 335
 Ile Ala Arg Ser Ala Ala Asn Val Arg Ala Gly Ala Thr Ser Pro Ile
 340 345 350
 Ala Ala Val Val His Ser Leu Leu Val Leu Leu Thr Leu Leu Val Leu
 355 360 365
 Ala Pro Met Leu Ser Tyr Leu Pro Leu Ala Ala Met Ser Ala Ile Leu
 370 375 380
 Leu Ile Val Ala Trp Asn Met Ser Glu Ala His Lys Val Val Asp Leu
 385 390 395 400
 Ile Arg His Ala Pro Lys Asp Asp Ile Ile Val Met Leu Leu Cys Leu
 405 410 415
 Ser Leu Thr Val Leu Phe Asp Met Val Arg Arg Asp His Tyr Arg His
 420 425 430
 Cys Ala Gly Ile Thr Pro Val Tyr Ala Gln Asn Cys Gln Tyr Asp Ser
 435 440 445
 Asn Gln His Val Ile Phe Asn Lys Arg Gly Glu Arg Val Ile Gly Arg
 450 455 460
 Thr Asn
 465

<210> 45

<211> 125

<212> PRT

<213> Xenorhabdus bovienii

<400> 45

Glu Ser Ile Gly Ala Lys Thr Ser Asn Val Asn Asn Thr Ser Arg Glu
 1 5 10 15
 Cys Thr Thr Ala Ala Ile Gly Glu Val Ala Pro Ala Arg Thr Leu Ala
 20 25 30
 Ala Glu Arg Ala Ile Ala Ala Val Ala Val Met Pro Pro Lys Lys Gly
 35 40 45
 Ala Ala Ile Leu Pro Asn Pro Trp Pro Ser Ser Ser Pro Leu Glu Trp
 50 55 60
 Cys Phe Phe Pro Val Ile Pro Ser Arg Ile Thr Ala His Ser Asn Asp
 65 70 75 80
 Ser Ile Ala Pro Ser Met Ala Ile Glu Asn Ala Ala Gly Ser Asn Ala
 85 90 95
 Asp Thr Val Phe Gln Leu Ile Ser Arg Glu Cys Val Ser Gly Lys Phe
 100 105 110
 His Gly Arg Thr Asn Trp Gly Arg Met Gly Gly Met Pro
 115 120 125

<210> 46
 <211> 161
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 46

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Ser | Tyr | Ser | Ile | Trp | Ser | Val | Ala | Ile | Thr | Ile | Gly | Ile | Val | Leu |
| 1 | | | | 5 | | | | | 10 | | | | 15 | | |
| Ala | Ser | Leu | Leu | Phe | Met | Arg | Lys | Ile | Ala | Asn | Met | Thr | Arg | Ile | Ser |
| | | | | 20 | | | | | 25 | | | | 30 | | |
| Thr | Ser | Ser | Leu | Thr | Ser | Ala | Glu | Lys | Gly | Leu | Leu | Val | Val | Arg | Ile |
| | | | | 35 | | | | 40 | | | | 45 | | | |
| Asn | Gly | Pro | Leu | Phe | Phe | Ala | Ala | Ala | Glu | Arg | Ile | Phe | Ala | Glu | Leu |
| | | | | 50 | | | | 55 | | | 60 | | | | |
| Arg | Glu | Lys | Ser | Ala | Asp | Tyr | Gln | Thr | Ile | Ile | Met | Gln | Trp | Asp | Ala |
| | | | | 65 | | | | 70 | | | 75 | | | 80 | |
| Val | Pro | Val | Leu | Asp | Ala | Gly | Gly | Leu | His | Ala | Phe | Gln | Gly | Phe | Val |
| | | | | | | | | 85 | | | 90 | | | 95 | |
| Arg | Glu | Leu | Gly | Lys | Glu | Lys | His | Ile | Val | Val | Cys | Asp | Ile | Pro | Phe |
| | | | | 100 | | | | 105 | | | 110 | | | | |
| Gln | Pro | Leu | Lys | Thr | Leu | Ala | Arg | Ala | Lys | Val | Met | Pro | Ile | Glu | Gly |
| | | | | 115 | | | | 120 | | | 125 | | | | |
| Glu | Leu | Ser | Phe | Tyr | Ala | Thr | Leu | Pro | Lys | Ala | Leu | Lys | Glu | Met | Ala |
| | | | | 130 | | | | 135 | | | 140 | | | | |
| Val | Asp | Tyr | Thr | Pro | Glu | Val | Cys | Ala | Ser | Ser | Glu | Lys | Ile | Gln | Gly |
| | | | | 145 | | | | 150 | | | 155 | | | 160 | |
| Gln | | | | | | | | | | | | | | | |

<210> 47
 <211> 173
 <212> PRT
 <213> Xenorhabdus bovienii

<400> 47

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Cys | Met | Ser | Asp | Val | Glu | Asn | Asp | Arg | Arg | Thr | Leu | Gly | Ser | Leu | Leu |
| 1 | | | | 5 | | | | 10 | | | | 15 | | | |
| His | Asp | Thr | Glu | Ala | Gln | His | Val | Asn | His | Gln | Ile | Val | Ile | Thr | Lys |
| | | | | 20 | | | | 25 | | | | 30 | | | |
| Val | Ala | Ala | Thr | Val | Thr | Gln | Asp | His | Leu | Val | Ile | Ala | Ala | Phe | Phe |

| | | |
|---|-----|-----|
| 35 | 40 | 45 |
| Glu Phe Phe Asn Asn Ile Ala His Leu Pro Arg Ala Asn Lys Leu Trp | | |
| 50 | 55 | 60 |
| Phe Phe Asn Ile Asn His Ser Thr Gly Phe Arg His Arg Phe Asn Gln | | |
| 65 | 70 | 75 |
| Ile Gly Leu Ala Gly Lys Glu Gly Trp Lys Leu Asn His Ile His His | | 80 |
| 85 | 90 | 95 |
| Ile Arg Asp Trp Leu Ser Leu Cys Arg Leu Met His Val Ser Asp Asn | | |
| 100 | 105 | 110 |
| Phe His Ala Glu Gly Leu Phe Gln Phe Leu Lys Asp Phe His Pro Leu | | |
| 115 | 120 | 125 |
| Phe Gln Pro Trp Pro Thr Ile Arg Ala Asp Arg Arg Thr Val Ser Leu | | |
| 130 | 135 | 140 |
| Ile Lys Arg Arg Phe Lys Asn Ile Arg Asn Ala Gln Phe Leu Cys His | | |
| 145 | 150 | 155 |
| Gly Asp Ile Val Leu Thr Asn Pro His Gly Gln Ile Pro | | 160 |
| 165 | 170 | |

<210> 48

<211> 308

<212> PRT

<213> Xenorhabdus bovienii

<400> 48

| | | |
|---|-----|-----|
| Leu Ser Cys Ile Arg Phe Ile Phe Leu Leu Ile Gln Gln Ile Tyr Leu | | |
| 1 | 5 | 10 |
| Pro Leu Thr Arg Glu Gly Ile Ser Met Gln Gln Lys Val Val Asn Ile | | 15 |
| 20 | 25 | 30 |
| Gly Asp Ile Lys Val Ala Asn Asp Leu Pro Phe Val Leu Phe Gly Gly | | |
| 35 | 40 | 45 |
| Met Asn Val Leu Glu Ser Arg Asp Leu Ala Met Arg Ile Cys Glu His | | |
| 50 | 55 | 60 |
| Tyr Val Thr Val Thr Gln Lys Leu Gly Ile Pro Tyr Val Phe Lys Ala | | |
| 65 | 70 | 75 |
| Ser Phe Asp Lys Ala Asn Arg Ser Ser Ile Arg Ser Tyr Arg Gly Pro | | 80 |
| 85 | 90 | 95 |
| Gly Leu Glu Glu Gly Met Lys Ile Phe Gln Glu Leu Lys Gln Thr Phe | | |
| 100 | 105 | 110 |
| Gly Val Lys Ile Ile Thr Asp Val His Glu Pro Ala Gln Ala Gln Pro | | |
| 115 | 120 | 125 |
| Val Ala Asp Val Val Asp Val Ile Gln Leu Pro Ala Phe Leu Ala Arg | | |
| 130 | 135 | 140 |
| Gln Thr Asp Leu Val Glu Ala Met Ala Lys Thr Gly Ala Val Ile Asn | | |
| 145 | 150 | 155 |
| Val Lys Lys Pro Gln Phe Val Ser Pro Gly Gln Met Gly Asn Ile Val | | 160 |
| 165 | 170 | 175 |
| Glu Lys Phe Lys Glu Gly Gly Asn Asp Gln Val Ile Leu Cys Asp Arg | | |
| 180 | 185 | 190 |
| Gly Ser Asn Phe Gly Tyr Asp Asn Leu Val Val Asp Met Leu Gly Phe | | |
| 195 | 200 | 205 |
| Gly Val Met Gln Gln Ala Thr Gln Gly Ala Pro Val Ile Phe Asp Val | | |
| 210 | 215 | 220 |
| Thr His Ala Leu Gln Cys Arg Asp Pro Leu Gly Ala Ala Ser Gly Gly | | |
| 225 | 230 | 235 |
| Arg Arg Ala Gln Val Ala Glu Leu Ala Arg Ala Gly Met Ala Val Gly | | 240 |
| 245 | 250 | 255 |
| Ile Ala Gly Leu Phe Leu Glu Ala His Pro Asp Pro Glu Asn Ala Lys | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 260 | 265 | 270 | | | | | | | | | | | | |
| Cys | Asp | Gly | Pro | Ser | Ala | Leu | Pro | Leu | Ala | Lys | Leu | Glu | Ser | Phe | Leu |
| | | | 275 | | | 280 | | | | 285 | | | | | |
| Met | Gln | Ile | Lys | Ala | Ile | Asp | Asp | Val | Val | Lys | Asn | Phe | Pro | Glu | Leu |
| | | | 290 | | | 295 | | | 300 | | | | | | |
| Asp | Thr | Ser | Lys | | | | | | | | | | | | |
| | | | 305 | | | | | | | | | | | | |

<210> 49
<211> 274
<212> PRT
<213> Xenorhabdus bovienii

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 400 | 49 | | | | | | | | | | | | | |
| Val | Asp | Gly | Ile | Lys | Met | Lys | Pro | Ile | Val | Asn | Tyr | Glu | Phe | Asn | Asn |
| | | | | | 1 | 5 | | | 10 | | | 15 | | | |
| Thr | Pro | Leu | Ile | Asp | Gly | Ile | Ile | Leu | Val | Ser | Lys | Ile | Ile | Arg | Pro |
| | | | | | | 20 | | | 25 | | | 30 | | | |
| Asp | Phe | Pro | Gln | Thr | Leu | Val | Ser | Glu | Gln | Leu | Thr | Ala | Leu | Val | Glu |
| | | | | | | 35 | | 40 | | | 45 | | | | |
| Glu | Ala | Arg | Gln | Arg | Leu | Ser | Ser | Ile | Thr | Asp | Ser | Lys | Val | Lys | Leu |
| | | | | | | 50 | | 55 | | | 60 | | | | |
| Asp | Ser | Leu | Leu | Thr | Leu | Phe | Tyr | Arg | Glu | Trp | Lys | Phe | Gly | Gly | Ala |
| | | | | | | 65 | | 70 | | 75 | | 80 | | | |
| Asn | Gly | Val | Tyr | Cys | Leu | Ser | Asp | Thr | Leu | Trp | Leu | Asp | Arg | Leu | Leu |
| | | | | | | 85 | | 90 | | | 95 | | | | |
| His | Ser | Arg | Gln | Gly | Ser | Pro | Val | Ser | Leu | Gly | Thr | Val | Phe | Thr | His |
| | | | | | | 100 | | 105 | | | 110 | | | | |
| Ile | Ala | Gln | Ala | Leu | Gly | Leu | Ser | Val | Gln | Pro | Val | Ile | Phe | Pro | Ile |
| | | | | | | 115 | | 120 | | | 125 | | | | |
| Gln | Leu | Ile | Leu | Arg | Ile | Asp | Leu | Leu | Asp | Gln | Pro | Thr | Trp | Phe | Ile |
| | | | | | | 130 | | 135 | | | 140 | | | | |
| Asn | Pro | Leu | Asn | Gly | Asp | Thr | Leu | Asn | Glu | His | Thr | Leu | Asp | Val | Trp |
| | | | | | | 145 | | 150 | | 155 | | 160 | | | |
| Leu | Lys | Gly | Asn | Ile | Gly | Pro | Thr | Val | Arg | Leu | Lys | Lys | Gln | Asp | Leu |
| | | | | | | 165 | | 170 | | | 175 | | | | |
| Gln | Glu | Ala | Asp | Asn | Val | Ser | Leu | Val | Arg | Lys | Ile | Thr | Asp | Thr | Ile |
| | | | | | | 180 | | 185 | | | 190 | | | | |
| Lys | Val | Ser | Leu | Met | Glu | Glu | Lys | Lys | Met | Glu | Leu | Ala | Leu | Lys | Ala |
| | | | | | | 195 | | 200 | | | 205 | | | | |
| Ser | Glu | Val | Val | Leu | Thr | Phe | Asp | Pro | Asp | Asp | Pro | Tyr | Glu | Ile | Arg |
| | | | | | | 210 | | 215 | | | 220 | | | | |
| Asp | Arg | Gly | Leu | Ile | Tyr | Ala | Gln | Leu | Asp | Cys | Asn | His | Ile | Ala | Val |
| | | | | | | 225 | | 230 | | 235 | | 240 | | | |
| Ser | Asp | Leu | Ser | Tyr | Phe | Val | Glu | His | Cys | Pro | Glu | Asp | Pro | Ile | Ser |
| | | | | | | 245 | | 250 | | | 255 | | | | |
| Glu | Met | Ile | Lys | Met | Gln | Ile | Asn | Thr | Ile | Glu | Gln | Arg | Leu | Ile | Val |
| | | | | | | 260 | | 265 | | | 270 | | | | |
| Leu | His | | | | | | | | | | | | | | |

<210> 50
<211> 316
<212> PRT
<213> Xenorhabdus bovienii

<400> 50

Ser Asp Arg Arg Gln Thr Gly Tyr Ala Tyr Ser Ala Asp His Tyr Arg
 1 5 10 15
 Ile Ser Gly Arg Ser Thr Val Cys Thr Val Arg Ala Gly Leu Met Asn
 20 25 30
 Tyr Gln Cys Trp Leu Gln His Ala Ala Thr Gln Leu Ser Glu Ser Asp
 35 40 45
 Ser Pro Lys Arg Asp Ala Glu Ile Leu Leu Gly Tyr Val Thr Gly Arg
 50 55 60
 Ser Arg Thr Tyr Leu Ile Ala Phe Asp Glu Thr Leu Ile Ser Ser Glu
 65 70 75 80
 Glu Leu His Gln Leu Asp Ser Leu Leu Val Arg Arg Ile Gln Gly Glu
 85 90 95
 Pro Val Ala Tyr Ile Ile Gly Glu Arg Glu Phe Trp Ser Leu Pro Phe
 100 105 110
 Ala Val Ser Pro Ala Thr Leu Ile Pro Arg Pro Asp Thr Glu Cys Leu
 115 120 125
 Val Glu Lys Ala Leu Glu Leu Leu Pro Asp Ser Pro Ala Arg Ile Leu
 130 135 140
 Asp Leu Gly Thr Gly Thr Gly Ala Ile Ala Leu Ala Leu Ala Ser Glu
 145 150 155 160
 Arg Asn Asp Cys Tyr Val Thr Gly Val Asp Ile Asn Ser Asp Ala Val
 165 170 175
 Met Leu Ala Gln His Asn Ala Glu Lys Asn Ala Gly Lys Leu Ala Ile
 180 185 190
 His Asn Val Asn Phe Leu Gln Ser Glu Trp Phe Ala Ala Val Gly Asn
 195 200 205
 Gln Gln Phe Asp Met Ile Val Ser Asn Pro Pro Tyr Ile Asp Glu Arg
 210 215 220
 Asp Pro His Leu Gln Glu Asp Ile Arg Phe Glu Pro Ala Thr Ala
 225 230 235 240
 Leu Ile Ala Ala Gln Asn Gly Met Ala Asp Leu Gln Ala Ile Val Gly
 245 250 255
 Gln Ala Arg His Phe Leu Ser Pro Asn Gly Trp Leu Leu Leu Glu His
 260 265 270
 Gly Trp Lys Gln Gly Thr Val Val Arg Asn Leu Phe Leu Glu Lys Gly
 275 280 285
 Tyr Gln Gln Ile Ala Thr Phe Gln Asp Tyr Gly Gly Asn Glu Arg Ile
 290 295 300
 Thr Ile Gly Arg Trp Asn Lys Asn Glu Thr His Ser
 305 310 315

<210> 51

<211> 289

<212> PRT

<213> Xenorhabdus bovienii

<400> 51

Val Glu Met Arg Glu Met Ala Gln Glu Glu Leu Lys Glu Ala Lys Ile
 1 5 10 15
 Arg Asn Glu Glu Leu Glu Gln Gln Leu Gln Leu Leu Leu Pro Lys
 20 25 30
 Asp Pro Asp Asp Glu Arg Asn Cys Phe Leu Glu Val Arg Ala Gly Thr
 35 40 45
 Gly Gly Asp Glu Ala Ala Ile Phe Ala Gly Asp Leu Phe Arg Met Tyr
 50 55 60
 Ser Arg Tyr Ala Glu Ala Arg Arg Trp Arg Val Glu Ile Ile Ser Ala
 65 70 75 80

Asn Glu Gly Glu His Gly Gly Tyr Lys Glu Val Ile Ala Lys Val Ser
 85 90 95
 Gly Asp Gln Val Tyr Gly His Leu Lys Phe Glu Ser Gly Gly His Arg
 100 105 110
 Val Gln Arg Val Pro Glu Thr Glu Ser Gln Gly Arg Ile His Thr Ser
 115 120 125
 Ala Cys Thr Val Ala Val Met Pro Glu Ile Pro Glu Ala Glu Leu Pro
 130 135 140
 Asp Ile Ser Pro Gly Asp Leu Lys Ile Asp Thr Phe Arg Ser Ser Gly
 145 150 155 160
 Ala Gly Gly Gln His Val Asn Thr Thr Asp Ser Ala Ile Arg Ile Thr
 165 170 175
 His Leu Pro Thr Gly Ile Val Val Glu Cys Gln Asp Glu Arg Ser Gln
 180 185 190
 His Lys Asn Lys Ala Lys Ala Met Ser Val Leu Ala Ala Arg Ile Arg
 195 200 205
 Ala Ala Glu Met Arg Lys Arg Gln Glu Val Glu Ala Ser Glu Arg Arg
 210 215 220
 Asn Leu Leu Gly Ser Gly Asp Arg Ser Asp Arg Asn Arg Thr Tyr Asn
 225 230 235 240
 Phe Pro Gln Gly Arg Val Thr Asp His Arg Ile Asn Leu Thr Leu Tyr
 245 250 255
 Arg Leu Asp Glu Val Ile Glu Gly Lys Leu Asp Met Leu Ile Gln Pro
 260 265 270
 Ile Ile Ile Glu Tyr Gln Ala Asp Gln Leu Ser Ala Leu Ser Glu Gln
 275 280 285
 Asp

<210> 52
 <211> 37544
 <212> DNA
 <213> Xenorhabdus bovienii

<400> 52

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| ggatcagctg | gtttgccacc | ggatcccca | ccgttgcgc | cctgttagcg | gaggattct | 60 |
| ggcacggta | caaacaggct | ttccccccct | ttacctgccc | tttacgcattt | tgaccctg | 120 |
| ataaaagaaca | ggatgttact | ctcgccccct | cgacgaaga | gcattattgg | ctgcaccggg | 180 |
| cgttgcaagg | ccaacccgta | cacagtggagg | tctatggcga | cgatggcacc | gcccaggcgg | 240 |
| gtatcccccta | taccgttatg | gacagtggc | cccagttcg | gttctgacg | gtttaccgg | 300 |
| gtaactcacc | gacagtcctgg | ccgagttgtga | ttgaacagag | aacctggcag | tacgaacgg | 360 |
| ttggccatgta | tccgcaatgc | catcagcagg | tggtgctgaa | cagtgaccgc | tacggtttc | 420 |
| cacgggagac | cgtcgacatt | gcttatccgc | gccccttaa | gcctgcgg | tcacccattacc | 480 |
| cgatcgtct | gccggcgacg | ttattcgaca | gcagctatga | tgagcagcaa | cagcaattgc | 540 |
| ggcttacccg | gcaacggcaa | cattaccatc | acctgactga | cactgaacat | caagtgcgg | 600 |
| gactgcctga | tgtcatgcga | agcgatgcct | ggggctatcc | gcccggcgg | gtacccctg | 660 |
| aaggttcac | cctggaggac | ttgctggcag | agaacagtct | gataggcccg | ggcacggccat | 720 |
| tgacctattt | agggcatcaa | cgcgtggctt | ataccggAAC | gaccggAAAC | gaagaaaaaac | 780 |
| cgcacccgaca | ggcgctggtg | gcttataccg | aaaccgcgg | ttttgtgaa | ttggcccttgc | 840 |
| aggcctttaa | tggcacattg | agtcctgtgg | ccctggaaaa | gaaattaatc | gagtctgg | 900 |
| atttgtctgt | tccacggcca | ttcaataccg | gtgcggatc | gcccgtctgg | gtcgccccgtc | 960 |
| aggatatac | cgattacggc | gggtctggagg | cggttaccg | tccgttgct | cagcggacga | 1020 |
| cggtcagat | tggcaaaaac | accctccatt | gggataccca | ttactgtgcg | gtcgccgt | 1080 |
| tgcaggatgc | ggcgggtctg | tacacggatg | ccgcctatga | ttaccgcttc | ctgacccccc | 1140 |
| ttcagataac | cgatgcaat | gacaaccaggc | aacatatac | actgaccgcg | ctggggcagg | 1200 |
| tatcatccgg | ccggttctgg | ggcaactgagg | aaggactcc | gcagggttat | accccgctg | 1260 |
| aagaccgccc | atttacgcca | ccgtcctcag | tggcggaaagc | cctcgacttg | aaaccggatc | 1320 |

| | | | | | |
|-------------|-------------|-------------|-------------|-------------------|------|
| ttccgggtgc | caactgcatg | gtttatgcgc | cgctgagttg | gatgccgttgcgcacac | 1380 |
| atcaggaata | tatagccgc | tttacgtggc | aggcactgct | tgacgcgggg | 1440 |
| aagataagcg | ggtttgcgc | ctgggtttcc | gtcgctgggt | gcaacgtcag | 1500 |
| tgaatggca | ggcattggcc | gattcacggg | aaccgtcca | tgtcctaactg | 1560 |
| accgttatga | cacggatccc | gatcagcaac | tgcgcaagag | cgtcacctac | 1620 |
| tcgggcgtt | attgcaaaat | gcagtctacc | atgcgccagg | agaagcctgg | 1680 |
| cagatggcag | cctgatcacg | gacgcgaaag | gggcgcggct | cgtagcccat | 1740 |
| gctggcggt | ctcaggcagg | acagagtagt | acggtaaagg | gcaaccgcgc | 1800 |
| cgcattctt | cctgaatgcc | tggcagttacc | tcagtgtatg | cagtgcacgg | 1860 |
| atgccgatac | acaccgttat | gaccgcgtcg | gccgggata | ccaggtgaga | 1920 |
| ggtatctgcg | ccaaaatcg | ctgacccccct | ggtttgcgtt | aatgaggat | 1980 |
| cgtctctta | attaacacga | taacgttaaa | taatcacacc | tccctgcccag | 2040 |
| aggttaacta | ctctatcaag | gaaagggttt | atgactgtaa | acagaggcga | 2100 |
| caaaaaacgc | cggaaatgac | ggttctggat | aaccggggc | tgaccgttcg | 2160 |
| tatcaccgccc | acccaaatac | ccccaccacc | accgtgaac | gatcaccgg | 2220 |
| actctctcag | gtcagttggc | gcacagcatt | gaccgcgtc | tgttgcact | 2280 |
| gataatacag | tcaatctaa | catgatttat | gatactgcac | tgaccgggtga | 2340 |
| acaaggagt | tcgatgcggg | taatgatctg | atattgaatg | acattacccg | 2400 |
| ctggccatca | atgcaaccga | agtcaactcg | acgtggcaat | atgagaatg | 2460 |
| ggacgcccgc | tcagttatcac | agaacagcct | gctggcgaag | caggccgtat | 2520 |
| tttgtctggg | cagggAACAG | tcaggcggag | aagaacagca | acctggccgg | 2580 |
| cgtcactatg | acaccgcgg | actgaaccag | acggacagta | ttgcgtttaa | 2640 |
| ctgtccgtca | cgcgcggact | gctgcggat | ggtacggacg | cagactggca | 2700 |
| gaacccgcct | ggaacgaccg | gctggcaccg | gaaaacttca | ccaccctgag | 2760 |
| gccaccggcg | cgttactgac | caccaccat | gccccccgt | acctgcagcg | 2820 |
| gacgttagcag | gcctgtcgac | tggcagttgg | ctgcgcgtt | ccccggggac | 2880 |
| atcgtgaard | ccctgacgta | ttccgcgcgc | ggtcagaaac | tgcgcaaga | 2940 |
| ggcgtgggt | ccacctacac | ctacgagccg | gagaccggc | gccttgcgtt | 3000 |
| aaacgcccac | agggacatgc | acaggggacg | aagggtttgc | aggacctgcg | 3060 |
| gaccgggtgg | ggaacgttgt | gaaagtgcg | aacgtgcgg | aggttacccg | 3120 |
| aaccaaaaag | tggtgcgg | gaacacctat | gtctatgaca | gcctgtatca | 3180 |
| gccaccgggc | gcaaatggc | caatatcg | caacaaagca | cgctgttacc | 3240 |
| ctcattgata | gcagttacta | cagcaactat | tccgcac | acaattatg | 3300 |
| aactctgacgc | agatacgta | cagtgcctc | gccactggta | acagttacac | 3360 |
| acggtctcag | atcacagcaa | ccggcagtg | ttggacacgc | tgacggatg | 3420 |
| gtggatgcac | tttcactgc | ggcgccgcac | cagatccc | tcggcaaa | 3480 |
| gtctggacgc | cgcgcggta | gctgtgtaaa | gtggcaccgg | tgtacgt | 3540 |
| tccgaccagg | aatcctatcg | ttatgatg | gccagtcagc | gatcatca | 3600 |
| cagcagacgg | ctaacagctc | gcaggcgcag | agcacgt | acctggccagg | 3660 |
| cacaccacaa | taaatggc | gacgggtaaa | gaggtgtac | acgttatc | 3720 |
| gcgggcccgt | cgcaggtgc | ggtaactgc | tgggagaacg | gaaagccgg | 3780 |
| aacaaccaga | tgcgtacag | ctatgataac | cttacggca | gcagcggt | 3840 |
| ggtgacggac | aaattatcg | tatggagaa | tactaccgt | acggggc | 3900 |
| acggcgagga | gtcagacaga | ggctgttac | aagactgt | ttactcagg | 3960 |
| gatgcaacgg | ggctgttata | ttacggctac | cggattacc | caaggagcgg | 4020 |
| ctgagtgccg | acccggcg | cactatcg | gggctgaacc | tgtaccg | 4080 |
| aacccggcga | cactggatg | taaaaacgg | ctagcccc | gaaatagata | 4140 |
| ccatttattc | atgaggacag | gattttcgt | ctggcaagcg | cgaatgtt | 4200 |
| cataataaaat | ctgacatcat | tgcgttgc | gaagataaag | cattagat | 4260 |
| accaatagta | ttgagcagtt | ttcaaaaaaa | cctaaaggaa | aagcaatcc | 4320 |
| cctgatatta | aagaaaggct | actcaataat | atagtacat | acctgag | 4380 |
| ggagatcagc | tgtatgtaaa | cgtctatgg | cattctgc | aaccatttt | 4440 |
| tcgggatatt | aaaaatcat | catggAACAG | ctccaaaggag | gggctaact | 4500 |
| gattttagtaa | ataagttaa | attaccagaa | aatgcacaa | tcaagata | 4560 |
| agtgcgtaa | gtaaggcgc | tcatattacc | gtcacatcc | ctggAACAA | 4620 |
| agatacagtt | ccattataga | gaacaaagg | gaatttccc | ggtctttag | 4680 |
| gaaaatgagt | taattaaact | acagccggc | agatgtata | tggttatctt | 4740 |

| | | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|------|
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